



# LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC with 'A' Grade, ISO 9001:2015 Certified Institution

Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada

L.B.Reddy Nagar, Mylavaram-521230, Krishna Dist, Andhra Pradesh, India

## DEPARTMENT OF MECHANICAL ENGINEERING

### Summary of Events Organized by ISHRAE in A.Y: 2020-21

S.No	Name of the Event	Resource Person	Date	Number of Students Participated
1.	One day workshop on “ Water and air cooled chillers”	1.Mr.B.Anand, Genex Consultants 2. Mr.Shaik Jilani, Manager, large deals, Trane Technologies	04-06-2021	81
2.	LBRCE-ISHRAE student chapter renewal installation and CWC members selection and Technical Talk	Mr.Thirunavukkarasu, Regional Director- South Technical Talk by Mr.Vijayabaskaran, ISHRAE	07-01-2021	53
3.	Webinar conducted on “ Opportunities for Mechanical Engineers in HVAC and refrigeration Domain”	Dr.R. V.S.S.Prasad, National Vice-Chair-students activities	09-09-2020	51



**Total Number of Participants:** 84

**Topics covered in the one day workshop:** The fundamentals of chillers, characteristics of chillers, classification of chillers, cost estimation and analysis, emerging applications of chillers, the role of VFD in chillers.

**Objective of the Event:** To impart the knowledge on the fundamentals of water and air cooled chillers, types, characteristics, uses, applications, present demand, future demand and emerging trends of water and air cooled chiller technologies.

**Outcome of the Event:** The 84 participants who attended the webinar gave their feedback on the Resource person(s) sessions and gained knowledge on the water and air cooled chillers.

### Presentation on Air-cooled Chillers to



## Students Chapter

Shaik. Jilani

12/06/2021

1

### Water-cooled screw vs Air-cooled screw

CAPACITY	400	400
	Screw	ACS
Working Qty	1	1
Type of compressor	Screw	Screw
Installed capacity	400	400
COP at AHRI conditions	0.572	1.15
IPLV @ AHRI	0.34	0.65
Operating cost		
kwh/TR at Design conditions	0.572	1.150
IPLV	0.34	0.65
Chiller power consumption as per IPLV/hr	136	260
Primary Pump power Consumption in Kw	11.07	11.07
Condenser Pump power consumption in kw	13.8	0.0
Cooling tower power consumption in kw	12.0	0.0
Total Operating Cost Per Annum	172.9	271.1
Cooling tower evaporation drift/ blow down losses cum/hr	Required	NA
De-scaling ,chemicals	Required	NA

16

### Improve Air-cooled chillers

1.VFD to Compressors



Variable Speed Drive (VSD)  
Based on design load, seasonal performance, and sound performance

2.VFD on condenser fans



3.Adiabatic kits



Figure (1) a typical wire mesh installation

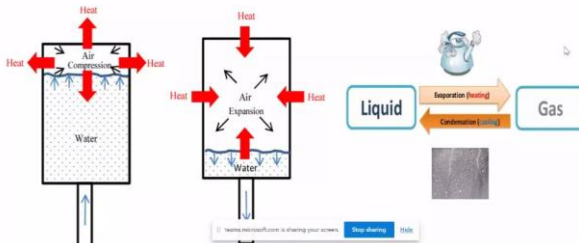
17

### Parameters required to select chiller

- Capacity of Chiller:200 TR
- Chilled water in/out:12.22/6.67 deg C
- DBT:35 deg C
- FF:0.0001 hr-ft<sup>2</sup>-F/BTU

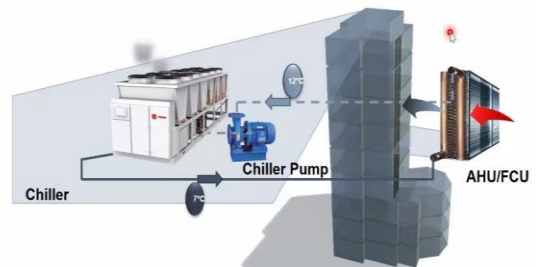
15

### Terms using refrigerating cycle



3

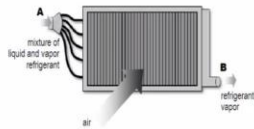
### Chilled Water System – Air cooled



11

## Basic Components

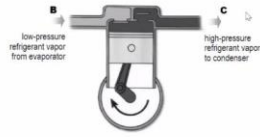
### Evaporator



- Mixture of refrigerant vapor + Refrigerant passes through evaporator.
- Refrigerant transfer the heat to other medium ( Water/Air )

5

### Compressor



- Low pressure refrigerant vapor enters compressor.
- Refrigerant transfer the heat to other medium ( Water/Air )

## Units

### One ton of Refrigeration

One ton of refrigeration =  $336 \times 1000 \text{ kJ} / 24 \text{ hrs.}$   
 $= 336 \times 1000 \text{ kJ} / \text{min}$   
 $= 22400$   
**One ton of refrigeration =  $233.22 \text{ kJ} / \text{min}$**   
 $= 3.8889 \text{ kJ} / \text{sec}$   
 For calculation purpose,  
**One ton of refrigeration =  $12600 \text{ kJ} / \text{hr}$**   
**Ton of refrigeration =  $210 \text{ kJ} / \text{min}$**   
 $= 3.5 \text{ kJ} / \text{s}$

### COEFFICIENT OF PERFORMANCE

$$\text{COP} = \frac{\text{KW Refrigeration Effect}}{\text{KW input}}$$

$$= 3.516 / ( \text{kw} / \text{ton} )$$

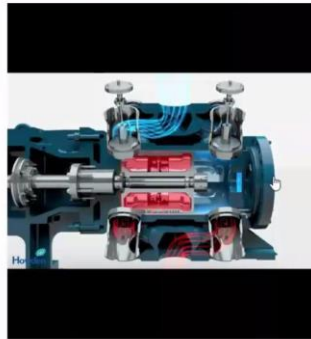
$$= 3.516 / 1.065$$

$$= 3.30$$

12

12

## RECIPROCATING CHILLERS



## CHILLER SELECTION

$$\text{Load} = \text{Flow} \times \Delta T (\text{Delta Temp})$$

$$1- \text{Chiller GPM} = (\text{TR} \times 24) / \Delta T (\text{Delta Temp})$$

$$2- \text{Cooling Tower GPM} = (\text{TR} \times 30) / \Delta T (\text{Delta Temp})$$

## CHILLER SELECTION

### Diversity factor:

Diversity Factor is ratio of the sum of the individual maximum demands of the various sub circuit of a system to the maximum demand of the whole system.

**Diversity Factor = Sum of Individual Maximum Demands / Maximum Demand of the System.**

**Diversity Factor = Installed load / Running load.**

Thumb Rule : 0.7 to 0.8 of total load .

Eg : For a building HVAC load of 1200 TR

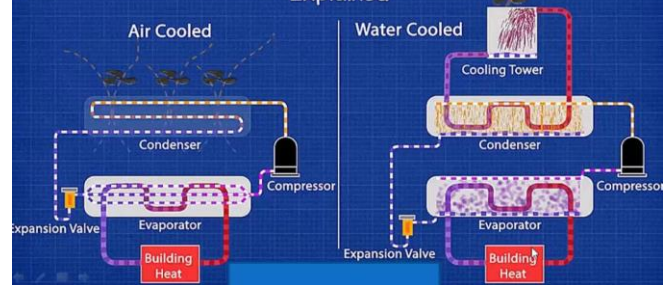
When we consider diversity at 0.8 then the load will be  $1250 \times 0.8 = 1000 \text{ TR}$ .

We can select the chiller for 1000 TR capacity

## TYPES OF CHILLERS

























### Chiller Types & Application

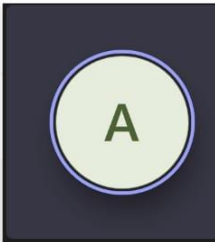
Explained



📞 📷 H 30% 11:11





































← In meeting (83)


-  20765A0338 Attendee 
-  20765A0339 Attendee 
-  20765A0340 Attendee 
-  20765A0341 Attendee 
-  20765A0342 Attendee 
-  20765A0344 Attendee 
-  **A** Anand 
-  **A** Anusha 
-  **GM** Guna Sahithi Madala 
-  **J** Jilani 
-  **S** Sandeepani 
-  **VIJAYA KUMAR. P** 

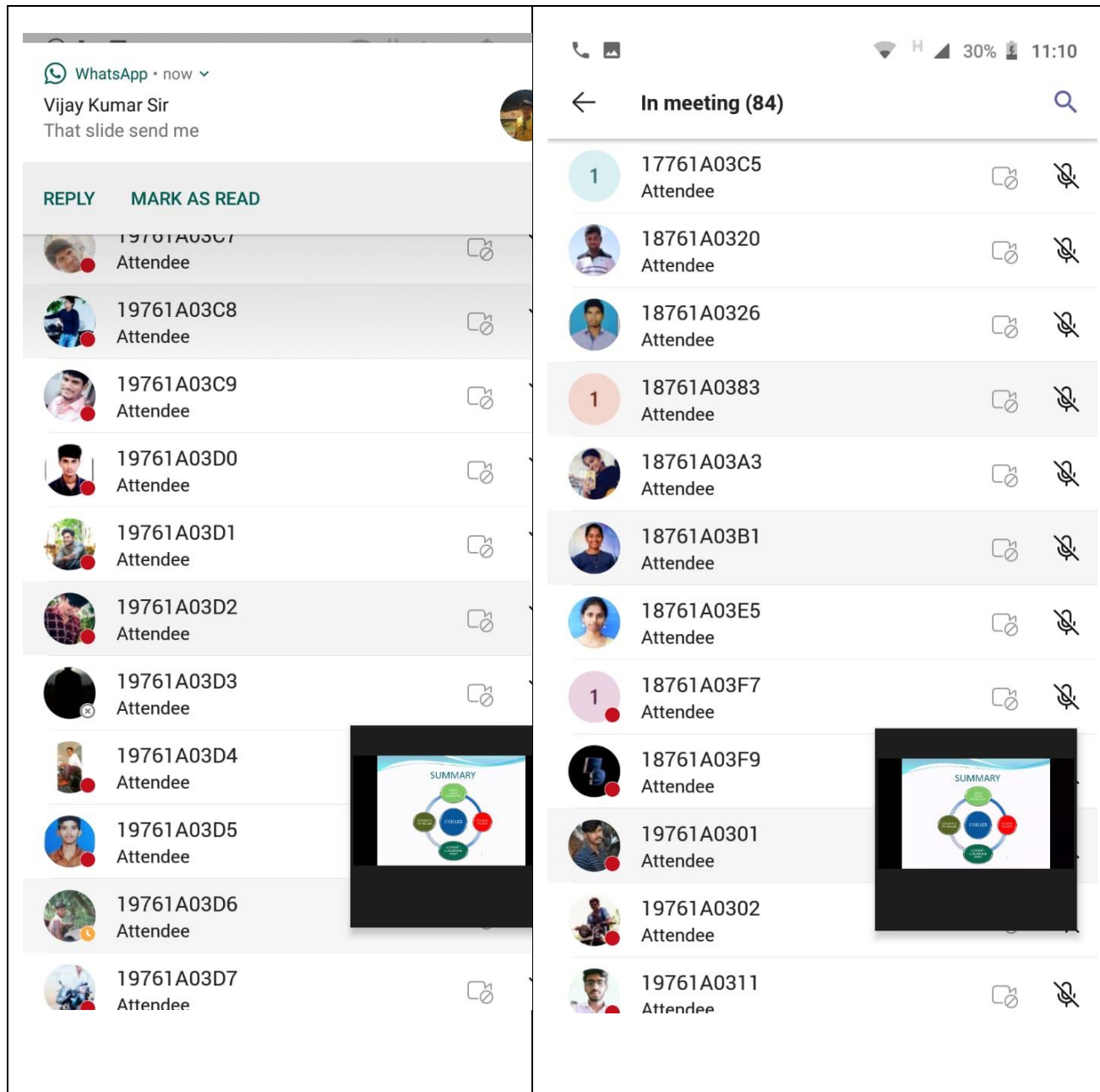


📞 📷 H 30% 11:11

← In meeting (83) 🔍

-  20765A0332 Attendee  
-  20765A0333 Attendee **On hold**  
-  20765A0334 Attendee  
-  20765A0335 Attendee  
-  20765A0336 Attendee  
-  20765A0337 Attendee  
-  20765A0338 Attendee  
-  20765A0339 Attendee  
-  20765A0340 Attendee  
-  20765A0341 Attendee  
-  20765A0342 Attendee  
-  20765A0344 Attendee  

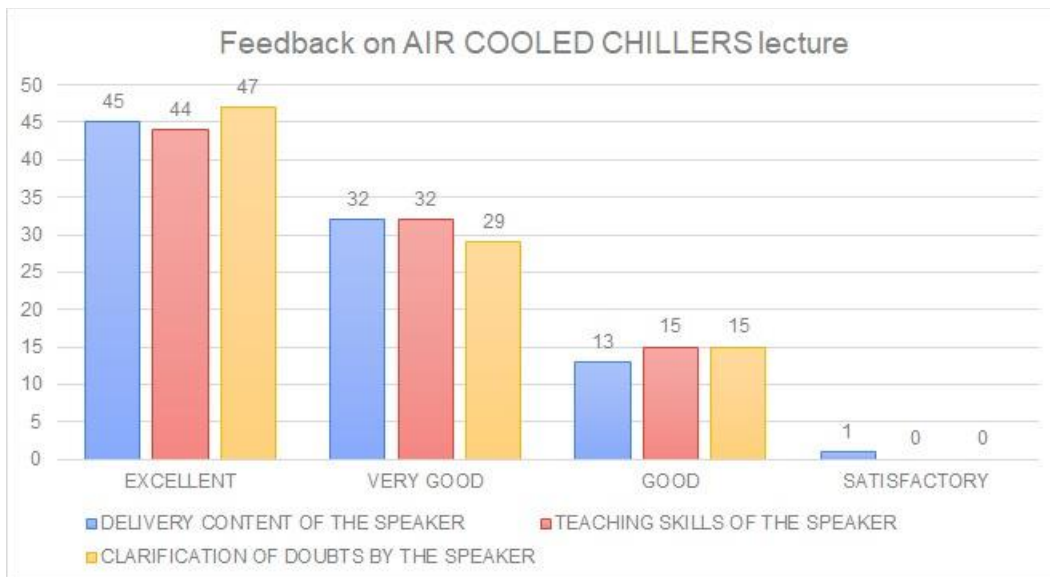
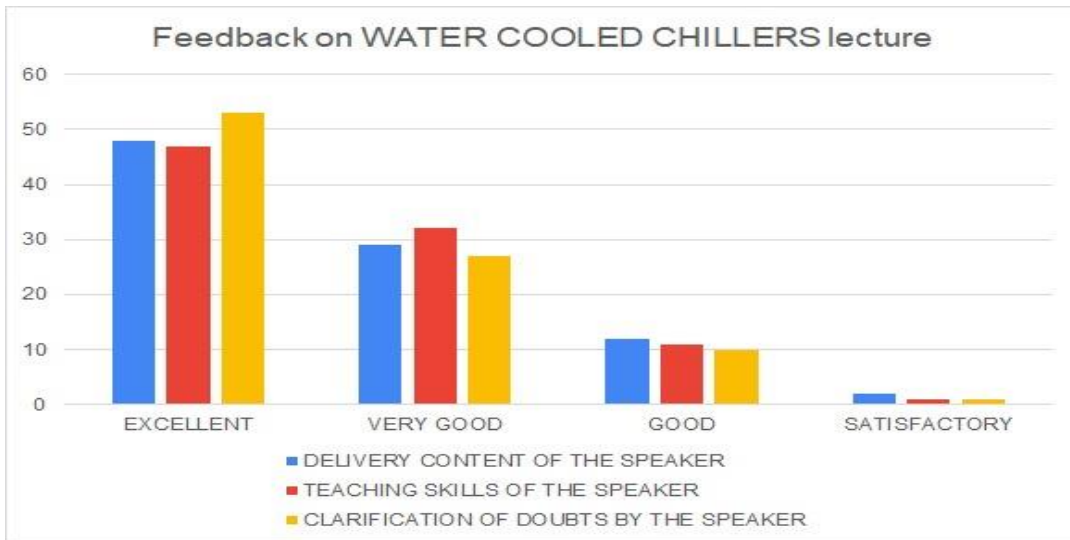





### Feedback / Suggestions:

1. To conduct advanced topics on water and air cooled chillers
2. To arrange virtual tour to Refrigeration and Air-conditioning industries

**Feedback Report:** The student participants gave their feedback on the one day workshop and the responses were shown in the form of graph given below.



  
 HEAD  
 Dept. of Mechanical Engineering  
 LAKIREDDY BALI REDDY COLLEGE OF ENGG  
 MYLAVARAM - 521 230, Krishna Dt., A.P.





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**L.B.Reddy Nagar, Mylavaram-521230, Krishna Dist, Andhra Pradesh, India**

**DEPARTMENT OF MECHANICAL ENGINEERING**

**LBRCE-ISHRAE Student chapter renewal, CWC members Swearing  
on ceremony and**

**Technical Talk by Mr.Vijayabaskaran on “Cold chain 4 Life”**

Event Type : WEBINAR

Date / Duration : 07-01-2021/ 2:00 pm-3:30 pm

Resource Person : 1) Mr. Thirunavukkarasu, Regional Director- South  
2) Mr. Vijayabaskaran, Ex-President ISHARE Chapter, Chennai

Name of Coordinator : Dr.P.Vijaya Kumar

Target Audience : All ISHRAE registered students

Total no of Participants: 53

Objective of the event : To make students aware of the applications of Refrigeration for  
preserving medicines and vaccines.

Outcome of event : 1) Students were able to know the use of refrigeration for vaccine  
preservation in different methods.  
2) Students got their doubts clarified with the Resource Person on various  
technical aspects in order to take up project works.

### **Description / Report on Event:**

A webinar was organized by ISHRAE Student chapter of LBRCE in association with ISHRAE Chapter Vijayawada for the Renewal of chapter and CWC members swearing in ceremony followed by technical talk on “**Cold chain 4 life**” The resource person Mr.Vijayabaskaran, Ex-President, ISHRAE Chapter, Chennai. The programme was started with the swearing in ceremony of CWC members by Mr.Thirunavukkarasu, Regional Director, South after the introduction of the guest by the programme chair Ms.Sandeepani Vajje. The session started at 2 PM and continued up to 3.30PM. The resource person has delivered the talk in a very lucid and easy to understand manner to the participants. He has provided good number of examples for making the students understand and motivated them. The resource person made students to get awareness on the opportunities in the HVAC & Refrigeration domain locally and globally. He emphasized on the strong technical knowledge required in students. The attendees were very much satisfied by attending the webinar.

### **Photographs:**

**ISHRAE**

Vijayawada Chapter



**STUDENTS**  
**ISHRAE**

**Department of Mechanical Engineering**  
**Lakireddy Bali Reddy College of Engineering, Mylavaram**

**TECH TALK & RENEWAL OF STUDENT CHAPTER by**

**ISHRAE Vijayawada Chapter**

## REFRIGERATION

### EXPERT SPEAKER



**S VIJAYABASKARAN**  
Consultant & Trainer

VIJAYABASKARAN is holding a Diploma in Refrigeration & Air conditioning, Industrial Refrigeration engineering and Industrial safety engineering. He has an overall experience of 30 years in Industrial refrigeration projects execution (Installation & Service) abroad and in India such as Ammonia Refrigeration projects at Kuwait, Nigeria, Sultanate of Oman, Thailand and Laos. He is currently engaged into Consulting - Industrial refrigeration system. He also trains on Safe operation of Ammonia refrigeration facilities and Industrial safety including food safety, Health, Work environment and First-aid. He is the Immediate Past President of ISHRAE Chennai Chapter

**Date: 7<sup>th</sup> Jan, 2020**

**Time: 2:00 p.m. – 3:30 p.m.**

**Chief Guest & Installation Officer**

**Mr. K Thirunavukkarasu - Regional director(South-2)**

**Registration Link:**

[https://us02web.zoom.us/webinar/register/WN\\_8UewnLgaTZGZUFPrXt8eWA](https://us02web.zoom.us/webinar/register/WN_8UewnLgaTZGZUFPrXt8eWA)

**Mr. Sk Muneer**

President

**Mr. K V T Prasad**

Student Chair

**Dr. P Vijay Kumar**

ISHRAE co-ordinator, LBRCE

**Dr. S Pichi Reddy**

HOD, ME Dept, LBRCE

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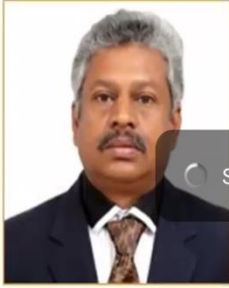
**RSVP**

**Saandeevani Vajje,**

Program Chair, Vijayawada chapter  
9703166644

REC

### EXPERT SPEAKER



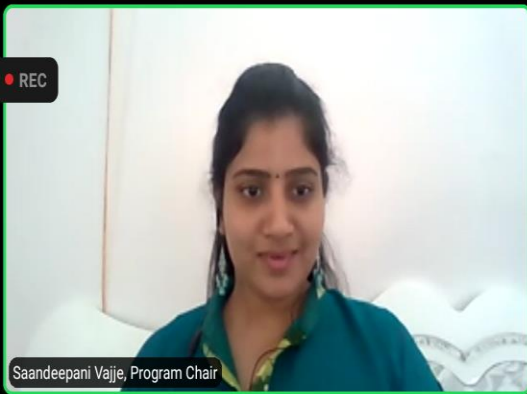
**S VIJAYABASKARAN**  
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Saandeepani Vajje, Program Chair has started screen sharing



REC



Saandeepani Vajje, Program Chair



Mr. Vijayabaskaran

## “COLDCHAIN 4 LIFE”



shutterstock.com • 1165268485



REC

## Learning objectives.

- **Introduction to Blood cold chain.**
  - The blood cold chain system & process
  - Temperature monitoring devices.
  - Blood cold chain equipment
- **Introduction to vaccine cold chain.**
  - Vaccine cold chain system.
  - Vaccine cold chain equipment and vaccine transport equipment .
  - Immunization schedule.

Saandeevani Vajje, Program Chair's screen



REC

## Blood facts

- Our country needs 4 Crore units of blood every-year and what we have is only 40 lakh units of blood.
- This is a huge difference and many people are still apprehensive including youngsters.
- Every two seconds some needs blood.
- More than 38,000 blood donations are needed every day.



REC

## Blood Transfusions

Blood Type	%	Receive Blood?	Give Blood?
O+	37%	O+, O-	O+, A+, B+, AB+
O-	6%	O-	Any Type
A+	34%	O+, O-, A+, A-	A+, AB+
A-	6%	O-, A-	A+, A-, AB+, AB-
B+	10%	O+, O-, B+, B-	B+, AB+
B-	2%	O-, B-	B+, B-, AB+, AB-
AB+	4%	Any Type	AB+
AB-	1%	O-, A-, B-, AB-	AB-, AB+



REC

## The “Blood-Cold chain”

- The cold chain is the system for storing and transporting blood and blood products ,within the correct temperature (+ 2 °C to 6 °C) range and conditions, from the point of collection from **blood donors to the point of transfusion to the patient.**



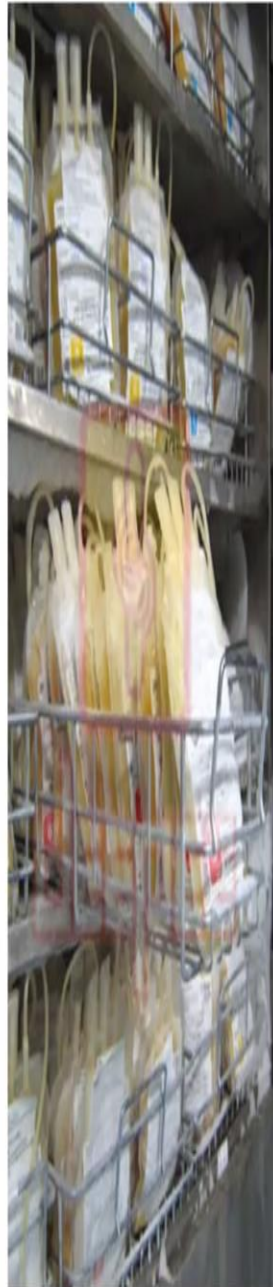
REC

## Blood cold chain equipment

- Ultra low temperature Plasma freezer @ - 80°C
- Internal capacity of 200 litres to 800 litres.
- Insulation is an essential part of the ultra freezer.
- Cascade solution. 2 (two) Refrigeration circuits connected.
- **Eco friendly Refrigerants R170 R 23 AND R290**



REC







### ICE PACKS @ -15°C

- Icepacks are key components of the cold chain.
- Used for ice lining inside the cold box and vaccine carrier.
- Frozen at DF @ -15°C

Ice packs




11:35:26

You are viewing Saradheepal Vajpe, Program Director's screen

View Options

## Blood cold chain equipment



### BLOOD BANK REFRIGERATORS

- Uniform 4°C Temperature Recovery
- Forced Air Circulation system
- Audio/ Visual Alarm
- Temp. Display

Mr. Saradheepal Vajpe

Participants (45)

Panelists (4) Attendees (41)

Search

- MJ Madireddy Jayanth
- AC Abdul Cherbaish
- AN Alekha Naveen Reddy
- A AVINAVH
- BS Bharu Sarkar
- CS Chaitanya Kumar
- CV Chinnadha Vamsi Krishna
- DG Divya Govtham
- DJ DIVYA JYOTHI SUNKARA
- GB Gabriel Gussa
- GP Ganapathapu Praveelika
- GP Ganesh Peram
- GB Gopi Bandaru
- GG GOKINNAH GIRI
- HK Harsha Krishna
- KB Khatkar Keshav

Start Video

Participants 45

Q&A

Chat


Share Screen

Leave

REC

## Platelets

- Platelets or thrombocytes are small, colorless cell fragments in our blood whose main function is to stick to the lining of blood vessels and help stop or prevent bleeding. Platelets are made in our bone marrow.
- Color : Colorless
- Shelf Life : 5 days.
- Storage Conditions : Room temperature with constant agitation to prevent clumping.
- Key Uses: Cancer treatments , Organ transplants, Surgery.



2:13 PM



Headphones, speaker, voLTE, 4G, and battery 49% icons.

REC



Saandeevani Vajje, Program Chair

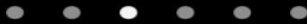
Siva Chenna Kesava Tallada



Mr. Thirunavukkarasu



Surya Sai Kumar Kuchibhotla



2:19 PM



Headset, speaker, VoLTE, 4G, and battery (47%) icons.

REC



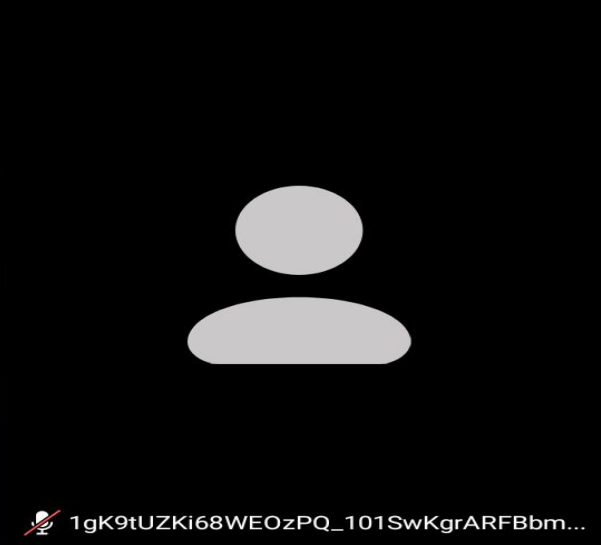
GOPINATH GOLI



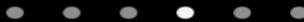
SASIKANTH KORADA



Gabriel Bussa



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L.B.Reddy Nagar, Mylavaram-521230, Krishna Dist, Andhra Pradesh, India

## DEPARTMENT OF MECHANICAL ENGINEERING

### WEBINAR REPORT ON

### OPPORTUNITIES FOR MECHANICAL ENGINEERS IN HVAC & REFRIGERATION DOMAIN

- Event Type : WEBINAR
- Date / Duration : 09-09-2020/ 11:00 am-12:00 pm
- Resource Person : Dr.R.V.S.S.Prasad, Business Head, Pavani Engineers, Hyderabad
- Name of Coordinator : Dr.P.Vijaya Kumar, Professor
- Target Audience : All ISHRAE students and interested students
- Total no of Participants: 165
- Objective of the event : To make students aware of the opportunities and motivate them to develop interest in HVAC & Refrigeration domain.
- Outcome of event : 1) Students were able to know the various job opportunities in design, manufacturing, production, marketing, plant maintenance etc
- 2) Students got their doubts clarified with the Resource Person on various technical aspects.

#### **Description / Report on Event:**

A webinar was organized by ISHRAE Student chapter of LBRCE in association with ISHRAE local chapter Vijayawada on “**Opportunities for Mechanical Engineers in HVAC & Refrigeration Domain**” on 09-09-2020. The resource person Dr.R.V.S.S.Prasad, Pavani Engineers, Hyderabad. The programme was started after the

introduction of the guest by the programme chair Ms.SandeevaniVajje.The session started at 11 AM and continued upto 12.15PM. The resource person has delivered the talk in a very lucid and easy to understand manner to the participants. He has given examples wherever necessary for making the students understand their stature and motivated them. The resource person made students to get awareness on the opportunities in the HVAC & Refrigeration domain locally and globally. To achieve the goals one has to equip himself with strong technical knowledge. The attendees were very much satisfied by attending the webinar.

**Photographs:**

**ISHRAE**

Vijayawada Sub-Chapter

**STUDENTS**  
**ISHRAE**

**Department of Mechanical Engineering**  
**Lakireddy Bali Reddy College of Engineering, Mylavaram**

**Is conducting a webinar in association with**  
**ISHRAE Vijayawada Sub-Chapter**  
**on**

## **Opportunities for Mechanical Engineers in HVAC & R Domain**

**SPEAKER****Dr. RVSS PRASAD**Business Head -  
Pavani Engineers

Dr. RVSS Prasad is currently working with Pavani Engineers as Head of Business Development. He has over 30 years experience in Operations Management, Quality Management, Project Management, IT, Air conditioning and Supply Chain Management. He has been working keenly on Theory of Constraints and he also received Black belt in Six Sigma. He received his PhD in management from JNTUH, Hyderabad for his work on improving productivity of Software testing in select organizations using innovative. He trained many associates in Project Management, Leadership development, Air Conditioning Design and many other programs. He is a prominent speaker in many institutions, conferences and seminars. He was also National Chair for Student Activities at ISHRAE HQ. He is President Elect at ISHRAE Deccan Chapter.

**Date: 9<sup>th</sup> Sept, 2020****Time: 11:00 a.m. – 12:00 p.m.****Registration Link:****[https://us02web.zoom.us/webinar/register/WN\\_cFruuz\\_JQdaMQjE5mZpybQ](https://us02web.zoom.us/webinar/register/WN_cFruuz_JQdaMQjE5mZpybQ)****Mr. Sk Muneer**

President

**Mr. K V T Prasad**

Student Chair

**Dr. P Vijay Kumar**

ISHRAE co-ordinator, LBRCE

**Dr. S Pichi Reddy**

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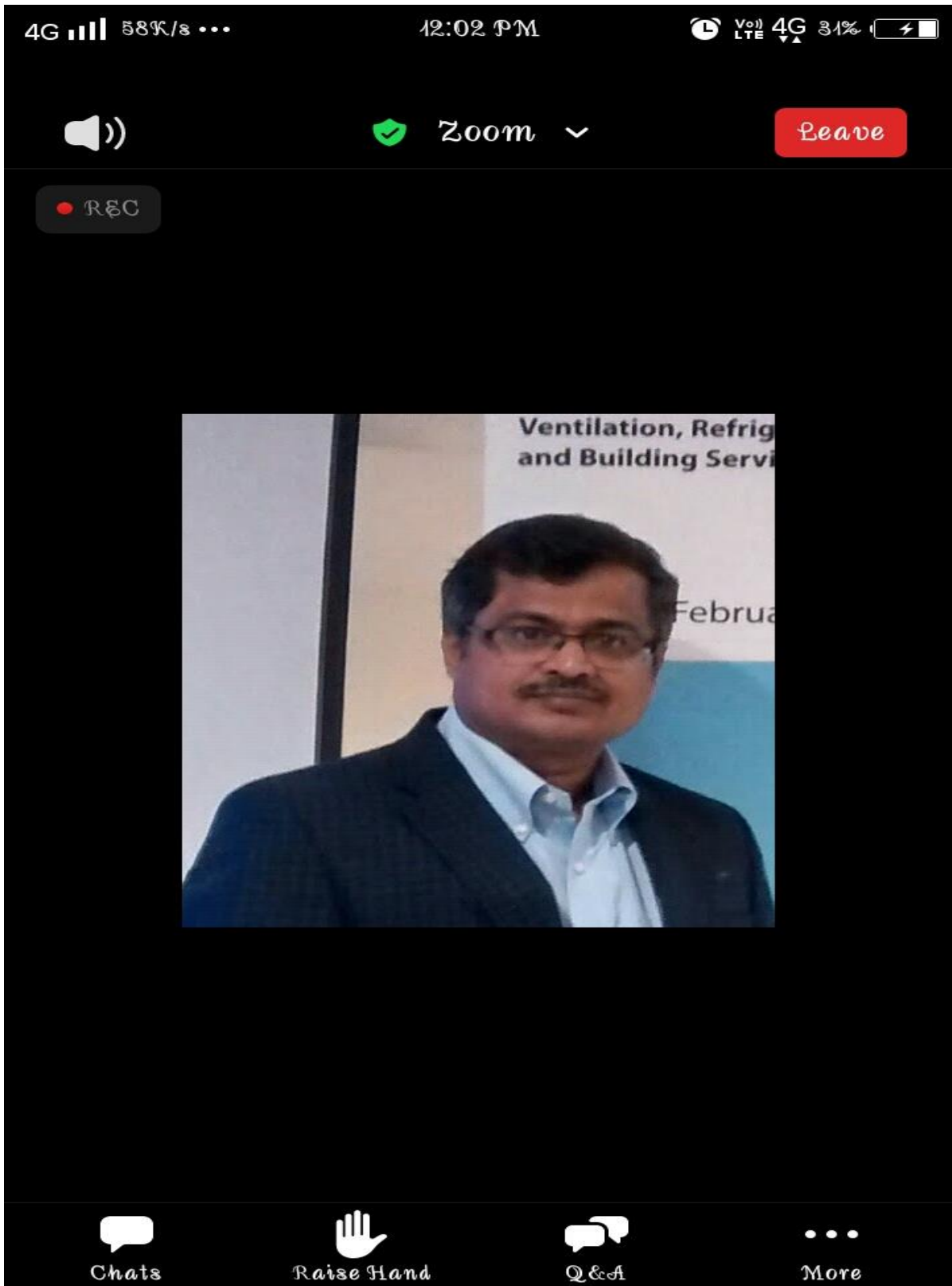
RSVP

**Saandeepani Vajje,**Program Chair, Vijayawada Sub-Chapter  
9703166644



**Dr.K.Appa Rao, Principal Addressing the students in Webinar**





Resource person Dr.R.V.S.S.Prasad, Business Head, Pavani Engineers, Hyderabad



**ISHRAE** Deccan Chapter *Ishrae Deccan Chapter is live now.*  
13 mins · 🌐

*Role of Mechanical Engineers in HVAC&R Field - Dr.RVSS Prasad.*

**LIVE** 👁 57

**Potential Industries**

- ISHRAE
- ISHRAE
- ISHRAE
- ISHRAE

ISHRAE Deccan Chapter

🔗 Share

**ISHRAE** Deccan Chapter *Ishrae Deccan Chapter was live.*  
5 September at 11:01 · 🌐

*Technical Webinar on "Ways to Increase & Maintain Chillers and Cooling Tower Efficiencies"*

Electrolysis - Be...

Webinar by ISHRAE Deccan chapter through facebook

# A FEW FREQUENTLY ASKED QUESTIONS AND

Zoom

Leave

## MINDSET OF STUDENTS



- “Which technology has more demand now?”
- “I want to join only in Design Projects”
- “AC& R is only for boys, not for girls”
- “If I get a job, my life will be secured.”
- “I studied in Telugu Medium, I can’t get good jobs.”
- “I want job only in Thermal, only in production, only in....”
- “My parents won’t allow me to go out of state.”
- “I need a job because I have to take care of my parents”
- “My seniors got an IT job and went to US just in one year itself.”

Frequently asked questions by students



Dr.R.V.S.S.Prasad, Resource Person Delivering the talk in Webinar

**ISHRAE**

## Student Benefits

 Technical Talks	 Industrial Visits	 ISPG ISHRAE Student Project Grant	 QUEST The International Student Design Competition	 ISHRAE Student Design Competition
 Access to ISHRAE publications & Journals	 HVAC Showcases	 WOMEN in ISHRAE	 Hands-on Workshops	 ISHRAE JOB JUNCTION
		 student connect	 Webinars	 Knowledge Bank <a href="http://www.ishrae.org/knowledgebank">www.ishrae.org/knowledgebank</a> zoom

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## Pumps

			
<b>Horizontal Split Casing Centrifugal Pump</b>	<b>Vertical Inline Centrifugal Pump</b>	<b>End Suction Centrifugal Pump</b>	<b>Air Separator</b>

zoom

Classification of pump in HVAC & R domain

**Indirect Direct Evaporative Cooling (IDEC) HMX**

With indirect direct evaporative cooling, the primary air stream is cooled first with indirect evaporative cooling and then cooled further with direct evaporative cooling.

**Solution - HMX**

- The HMX-Ambator is a two stage evaporative cooler, based on the Indirect Direct Evaporative Cooling (IDEC) technology

Indirect Direct Evaporative Cooling (IDEC)

# Evaporative Cooling System

2-Stage Evaporative Cooling

Cooling system in HVAC & R system

11:24
Voice LTE LTE

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I

**ISHRAE Deccan Chap...** 11:15 am

to me

Hi Kandhipalli Bhavya Lakshmi swori supritha,





















Thank you for registering for "Opportunities for Mechanical Engineers in HVAC & R Domain".

Please submit any questions to:  
[ishraehc@gmail.com](mailto:ishraehc@gmail.com)

















**This meeting has reached a maximum of 100 participants. Please try again later.**

OK

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	Galaxy J7 Prime	
	18761A0306 .	

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	370	
	376	

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