newsTRAC

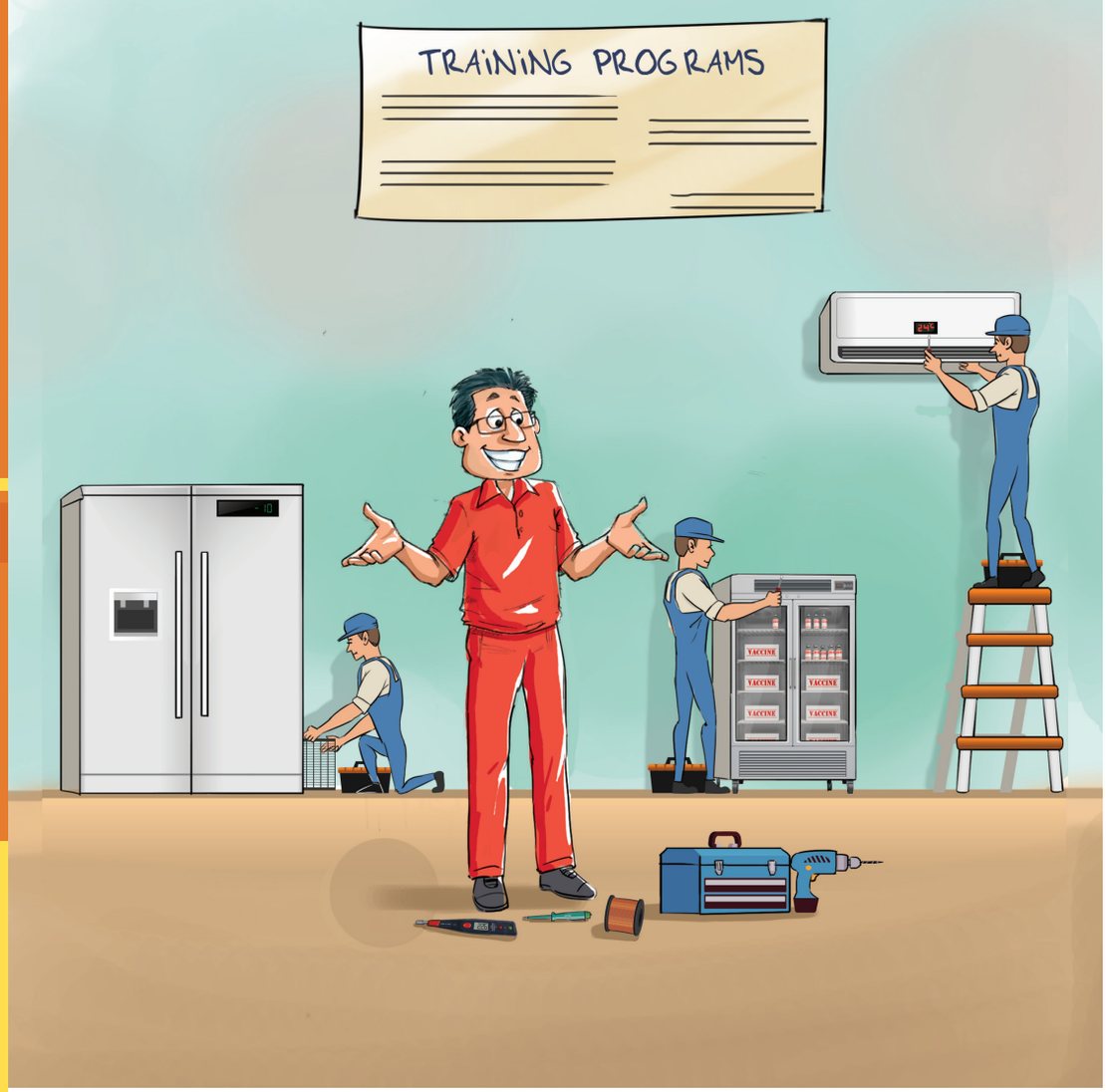
NEWSLETTER FOR TECHNICIANS IN REFRIGERATION AND AIRCONDITIONING (RAC) SERVICING SECTOR

ISSUE 1

SEPTEMBER 2022

Inside...

Editorial Team:



सत्यमेव जयते

प्रकृतिः रक्षति रक्षितः
Nature Protects if She is Protected

Ministry of Environment, Forest & Climate Change Government of India

UN environment
United Nations Environment Programme

giz
Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

teri
THE ENERGY AND RESOURCES INSTITUTE
Creating Innovative Solutions for a Sustainable Future

SAVE UR ZONE LAYER

मंत्री
पर्यावरण, वन एवं जलवायु परिवर्तन
और
श्रम एवं रोज़गार
भारत सरकार

सत्यमेव जयते

MINISTER
ENVIRONMENT, FOREST AND CLIMATE CHANGE
AND
LABOUR AND EMPLOYMENT
GOVERNMENT OF INDIA

स्वच्छ भारत
एक कदम स्वच्छता की ओर

आज़ादी का अमृत महोत्सव

भूपेन्द्र यादव
BHUPENDER YADAV

MESSAGE

The rapid increase of residential and commercial air-conditioners has led to increased demand for its servicing. Refrigeration and Air-conditioning (RAC) servicing sector relates directly to consumption of refrigerants as well as optimum and efficient performance of in-use air conditioning equipment. Training of RAC service technicians becomes very important, more so, the non-Ozone Depleting alternative refrigerants are either mildly flammable or flammable. The technicians need to be trained on their safe handling of such refrigerants as leakages of refrigerants contribute to greenhouse gas emissions.

Servicing sector is one of the priority areas of the India Cooling Actin Plan (ICAP) as this sector presents an immediate opportunity for securing environment benefits and livelihoods enhancement of RAC service technicians through training on good servicing practices including effective handling of flammable refrigerants as well as certification of trained technicians to inculcate confidence amongst the customers. Servicing sector will also be addressed under the implementation of HCFC phase out Management Plan Stage-III (HPMP Stage-III) from 2023 onwards where implementation will be synchronised with the recommendations of the ICAP for achieving the desired goals in the ICAP as well as the compliance obligations of the Montreal Protocol.

Newsletter for Refrigeration and Air-conditioning (RAC) servicing technicians (newsTRAC) is an excellent initiative to disseminate information on new developments and initiatives in the RAC service sector to the service technicians. In addition, this will also promote awareness among service technicians on good service practices for RAC as well as new alternative refrigerants entering the market and their effective handling.

Sustaining any newsletter including its timely publication is very important and steps should be taken to also maintain the quality. I take this opportunity to complement all the team members in bringing out the Newsletter.

With best wishes.

Date: 10 .09.2022

(Bhupender Yadav)

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आज़ादी का अमृत महोत्सव

सत्यमेव जयते

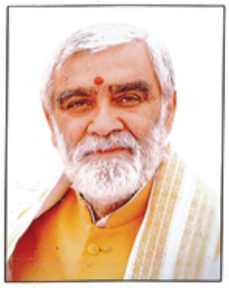
आहारशुद्धौ सत्त्वशुद्धिः

स्वच्छ भारत

एक कदम स्वच्छता की ओर

राज्य मंत्री
पर्यावरण, वन एवं जलवायु परिवर्तन
उपभोक्ता मामले, खाद्य और सार्वजनिक वितरण
भारत सरकार
MINISTER OF STATE
ENVIRONMENT, FOREST AND CLIMATE CHANGE
CONSUMER AFFAIRS, FOOD & PUBLIC DISTRIBUTION
GOVERNMENT OF INDIA

अश्विनी कुमार चौबे
Ashwini Kumar Choubey



MESSAGE

Servicing Sector is an integral part of the Refrigeration and Air-conditioning (RAC) industry. In recent years, the importance of servicing sector has further increased as most of the emissions of refrigerants to the environment takes place during servicing of RAC equipment. As per the industry estimates, the servicing sector accounts for about 45% of refrigerants consumed annually in the country. Hence, servicing sector has been taken up as a priority area since the beginning of implementation of the Montreal Protocol.

The introduction of low global warming potential technologies is becoming a challenge for the servicing sector for seamless transition to a level where servicing technicians are equipped with the skills, tools and equipments for handling new flammable refrigerants. Most of the non-Ozone Depleting Substances (ODS) and low Global Warming Potential (GWP) technologies have safety concerns, including refrigerant handling, equipment installation and servicing. The understanding of good servicing practices relating to these technologies and lack of adequate resources for procuring equipment and tools by the RAC service technicians are becoming increasingly challenging and need to be addressed.

The refrigeration and air-conditioning of servicing sector is to be implemented as part of the HCFC Phase out Management Plan-III in close cooperation with the RAC industry as well as the Ministry of Skill Development and Entrepreneurship with the objective to works towards sustainability of this sector by 2030.

Newsletter is an effective medium of promoting awareness to the service technicians not only on good servicing practices, but also on the developments in the sector both in the country as well as globally. I commend the team associated in bringing out this newsletter.

(ASHWINI KUMAR CHOUBEY)

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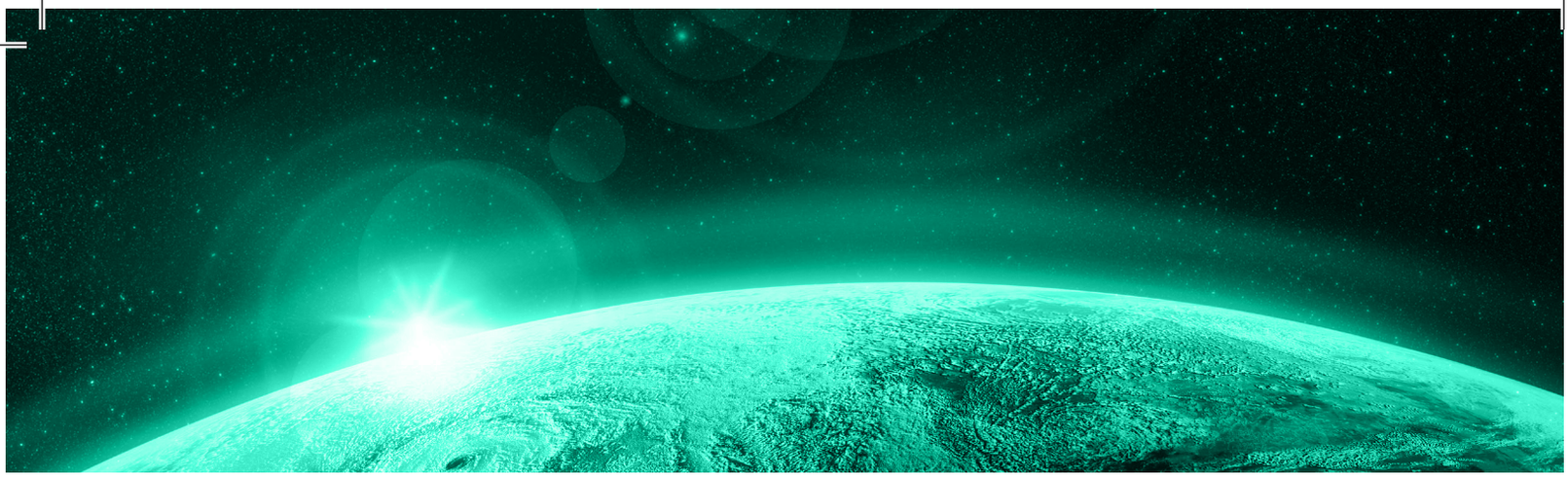
Residence : 30, Dr. APJ Kalam Road, New Delhi-110003, Tel.: 011-23794971, 23017049



WORLD OZONE DAY 2022

Montreal Protocol@35
global cooperation protecting life on earth

As the Montreal Protocol turns 35 on World Ozone Day, we will remember how the Protocol ended one of the biggest threats ever to mankind: depletion of the ozone layer. When the world discovered that ozone-depleting gases used in aerosols and cooling were creating a hole in the sky's protective ozone layer, the countries came together. Their joint efforts soon showed how multilateralism and effective global cooperation could work as they gradually phased out these harmful gases. The good news is that the ozone layer is healing, allowing it once again to shield humanity from the sun's harmful ultraviolet radiation.

The actions emanating from the Montreal Protocol have protected millions of people from skin cancers and cataracts over the years. It has allowed vital ecosystems to survive and thrive. It has safeguarded life on Earth. Above all, it has slowed down climate change. Had ozone-depleting chemicals not been banned, we would be looking at a catastrophic global temperature rise of an additional 2.5°C by the end of this century.

As we continue to protect the ozone layer, it will continue to safeguard us and all life on earth. It also means a cooler planet as more countries ratify the Amendments to the Protocol. This also means more people being able to access vital cooling technologies without the use of ozone depleting substances (ODS), that further warm the planet. It also means the Protocol continues to send a clear and lasting message: that global cooperation to protect life on earth is our best chance for a brighter future.

The theme for the 2022 International Day for the Preservation of the Ozone Layer, to be marked on 16 September, is **Montreal Protocol@35: global cooperation protecting life on earth**.

The theme recognises the wider impact the Montreal Protocol has on climate change and the need to act in collaboration, forge partnerships and global cooperation to address climate challenges and protect life on earth for future generations.

INDUSTRY PERSPECTIVE - OPPORTUNITIES FOR RAC TECHNICIANS

By Jogesh K Jaitly – *Head of Sales & Service****, Srinivasu. Moturi –*** *Head of R&D, Voltas Limited*

Air conditioning is increasingly becoming a necessity as summer temperatures have been rising exponentially in most parts of the country. Moreover, with rapidly increasing populations in urban areas and highrise residential buildings becoming the norm, air conditioning become a daily necessity. Air Conditioners - either Room AC/Commercial ACs - need installation and commissioning, as well as regular servicing for better performance and lower energy consumption.

In the near future air conditioning will offer immense opportunities for skilled manpower in repair and servicing of ACs.

Current Indian market scenario

Room air conditioners per house hold (penetration) level is very less as compared with other developed countries. India is at just 5% penetration. However, market size has increased exponentially in the last 12 years, from 0.3 million units in 2007 to 7.5 million in 2019. This is expected to reach up to 8 times (50~60million units) as per **ICAP (India cooling action plan)** by 2037-38. This steep growth is expected based on rising GDP and a fast increasing population in metro cities, and improved affordability.

Considering the growth path of RAC market there is a huge requirement in RAC service sector, since room air conditioner need installation and develop glitches after extensive use. They may stop working unexpectedly due to wear and tear during their functional life. However, regular maintenance can extend the life of your air conditioner. To make sure that your air conditioner continues to work way beyond its expected life span it needs regular servicing.

Present Service technician's availability

The availability of skilled and certified manpower is the need of the hour across the Air Conditioning and Refrigeration industry, which is expanding at a very fast pace. The industry requires certified technicians to handle the Hydro chlorofluorocarbons Phase-Out Management Plan (HPMP) as per the Montreal Protocol.

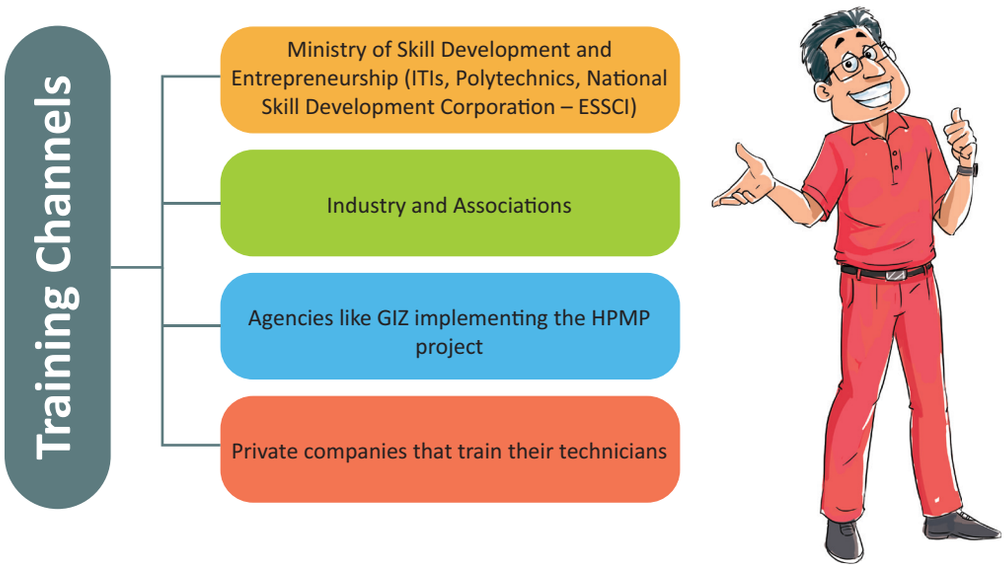
AC technicians are mostly in the informal sector, often not part of any social security schemes. Without access to safety equipment, training, or the means to advertise, they are often stranded with failing businesses and flat lined incomes. Moreover, the turnover of technicians is high owning to the business being seasonal. While technology is changing fast with increase in penetration of inverter AC, the biggest challenge is to provide training to all dispersed and informal sector technicians to facilitate technology adoption. There is a huge requirement for training and building capacities for RAC technicians. Trainings at regular intervals is also needed to upgrade their skills and understand the Good Service Practices to remain relevant in the business.

The training provides preliminary and practical information to the technicians that can be applied on a day-to-day basis. For example, the skills acquired during training can be applied during installation and servicing of room air-conditioners. Emphasis on safety during training, both in theoretical & practical sessions is necessary. Technicians should give greater emphasis to safety aspects when servicing appliances. Wearing hand gloves and goggles whilst brazing and handling refrigerants, and thorough evacuation of the appliances, are stressed repeatedly and demonstrated with the use of proper equipment and tools for one's own and others safety. This also helps in gaining confidence of the customer for that last mile happy service.

Good Servicing Practices standardization holds the key. Many participants at training programs have emphasised that for effective servicing, good service practices and systems standardization is must. They are of the view that uniformity can be achieved only by standardizing various service practices. There are various channels for training of RAC technicians in India. Trainings are available for beginners as well as experienced technicians in the form of short-duration refresher courses and recognition of prior learning programs.

Present Concerns

The Refrigeration and Air-Conditioning (RAC) service sector is largely unorganized and no social security benefits are available to informal AC technicians. The fast changing technology also makes it difficult for Informal sector technicians to update themselves with required skills. And this also leads to many accidents during servicing. Examples of safety concerns associated with refrigerants include physical hazards, toxic hazards and flammability, to name just a few.



It is often seen that recovery of the refrigerant is not a common practice during servicing. Often, the refrigerant is vented out and the appliance is subsequently recharged with virgin/ fresh refrigerant. It is also found that the system is topped up with refrigerant without a proper leak detection. This leads to continued leakage. There is a huge potential for savings, provided the technician is trained well to properly recover the refrigerant.

Due to seasonal demand of RACs it is very difficult for any organization to have sufficient trained technician in the peak summer season. Technician requirement may also vary on the basis of temperature conditions, resulting in inducting and involving technicians from the unorganized sector into temporary arrangements. This may adversely affect service quality and customer satisfaction due to skill constraints.

Opportunities in Future

Refrigeration and air conditioning jobs will always be in demand. And demand for service technicians will keep increasing with rising penetration of Air- Conditioners in India. Nearly every building and home in big cities has a heating and air conditioning system. This will continue to provide a great career opportunity for individuals who enjoy working with people, have an aptitude for technical work and seek job security. RAC jobs will continue to exist in every community where there are people in buildings and infrastructure expansion is happening rapidly. Skilled technicians can start their career as an employee or can start their own micro-entrepreneur. RAC skilled people are employed by installation contractors, construction companies, food wholesalers, engineering firms and service establishments. It is an extremely rewarding, and challenging career that teaches one great life skills as well as technical skills, and allows one to make a comfortable living.

Way Forward

Skill Enhancement with regular Training

The technicians are spread throughout India in cities and small towns where they practice their trade. The training programs for technicians need to be conducted not only in the state capitals or big cities of the country but also in the small towns.

Presently, production and consumption of HCFC-22 is being phased out under the Montreal Protocol. Therefore, alternative refrigerants that have similar or better properties suitable for all sub sectors, considering the zero-ozone depleting potential and low or negligible global warming potential are being considered as alternatives. There are some alternative refrigerants commercially available and used all over the world. Although these refrigerants are suitable for Air-conditioner, they have some unique characteristics like high pressure and flammability as compared to HCFC-22. And some refrigerants have safety issues.

So, as a technician it is very important to know the characteristics of these refrigerants. Often, the air-conditioning system also just gets topped up with refrigerant without proper leak detection and will, therefore, continue to leak. The HCFC-22 alternative refrigerants are flammable and/or have higher pressure, therefore, it is essential to follow good service practices (GSP) and all safety procedures while performing servicing. Understanding GSP, safety and handling of new refrigerants would require ongoing training.

Standardization of Good Service Practices

Good service practices enhance customer experience and generates the best possible performance from the appliances being serviced. It also ensures reliable working and long life of the appliance.

Good service practices enhances customer/user satisfaction and reputation of the servicing firm/ technician as being reliable and quality conscious and paves the way for growth in volume of business and profitability. Good Service Practices, apart from delivering a well-done job, is also key to reduction in emission of refrigerant.

Safety & Environmental Awareness

When at work, the technician must protect himself from any injuries. Personal protective equipment (PPE) must be worn by the technician when at work, to protect him from hazards. There is no exception to the rule that 'The safe way is the right way.' Work must be done by properly trained personnel equipped with the tools and equipment in good condition and of good quality. The term 'safety' is applicable to all air-conditioning activity. It applies to safety of the technician and customer, and of the tools and equipment.

Recovery & Reuse of Refrigerant

During servicing, recovery of the refrigerant is not a common practice. The refrigerant is often vented out during servicing or repair, and the Air-conditioner will be completely recharged. There will be huge savings in refrigerant consumption if proper recovery is carried out by the service technicians. However, the effort for applying such recovery, recycling and reclaim practices is high. No doubt this becomes even more difficult with the increasing number of refrigerant blends being promoted and placed in the market. Technicians need to use proper equipment and tools for servicing work, and all these must be in good condition and of good quality.

Team of Trained Trainer at Large Scale

For ensuring quality training for the technicians a team of qualified well-trained trainers would be essential with availability of latest technology products and required safety equipments and tools.

Certification Programs

Technician certification is important as a proof of their professional competency. A certified technician has wider scope of employment within the country as well as abroad. The servicing personnel require handling of high pressure, flammable and toxic gasses. Further, it has been well understood that trained and certified technicians could provide better services to customers, and increase their income. They could also help in reducing refrigerant consumption and their emissions, as well as maintain designed energy efficiency of the system, resulting in conservation of energy.

REFRIGERATION AND AIR CONDITIONING SERVICING TECHNICIANS - INDIAN SCENARIO

By Ashish Saraswat, *Associate Fellow –TERI,* ***Shivam Gupta,*** *Research Associate – TERI*

The rapid increase in ownership of refrigeration and air conditioning appliances/equipment in residential, commercial and Mobile Air Conditioning sector had a significant impact on the increased demand for servicing. The RAC servicing sector is of high importance because it is directly related to refrigerant consumption and the optimal and efficient performance of in-use air conditioning equipment. After the successful phase out of CFCs, Government of India launched HCFC phase out management plan in the country to phase out Hydrochlorofluorocarbons (HCFC) refrigerants to comply with the Montreal Protocol.

During this course, a variety of alternative refrigerants were introduced for handling of same by RAC service technicians. Therefore, knowledge and thorough understanding of alternative refrigerants is a necessity for service technician. New alternative refrigerants require different safety and handling procedures as compared to conventional refrigerants. For the servicing sector, it is essential to create a conducive environment in order to prepare them for a smooth transition. They have to graduate from earlier practices to handling new alternative refrigerants and electronic components with the skills, tools, and equipment they need. Capacity building measures encompassing upgradation of the technical knowhow /skills will lead to better livelihood by securing service technicians future jobs. Training service technicians would place them well in the market as they acclimatize to new alternative refrigerants and technologies.

Training and certification landscape of RAC servicing technicians sector

Training is a critical aspect for servicing technicians to deliver on their job properly. A well-crafted training module must include all aspects of the air-conditioning systems, from technical operation and maintenance to safety concerns and occupational hazards. Given the circumstances, training cannot be solely academic; practical training is an essential component of the learning process.

In order to impart the industry ready technicians in the country, India's technical and vocational education and training (TVET) system such as Industrial training institutes (ITIs) and polytechnics are the pillars of RAC servicing sector. RAC suppliers also provide trainings for RAC service technicians to ensure the business sustainability of new RAC products.

In India, there are several options for RAC technicians to undergo training. In general, there are trainings for beginners as well as short-term refresher courses/recognition of prior learning programmes for those who have worked in the industry for a while. Many institutes provide courses for both these groups.

The Ozone Cell, MoEF&CC had also developed a project jointly with the Electronic Sector Skill Council of India (ESSCI) for upskilling and certifying 100,000 RAC service technicians under the Skill India Mission- Pradhan Mantri Kaushal Vikas Yojana (PMKVY) of Ministry of Skill development. The technicians, trained under the skill India mission, were provided with various incentives including a stipend of INR 500 per certificate and accident insurance on receiving the certification. The RAC service technicians trained under National Skill Qualification Framework (NSQF) can also utilize the option of using finance available under Pradhan Mantri MUDRA Yojana (PMMY). This scheme was launched by the Hon'ble Prime Minister on April 8, 2015 for providing loans up to 10 lakh to the non-corporate, non-farm small/micro enterprises. Loan, to set up their businesses and procure relevant tools and equipment required for addressing the challenges of alternative refrigerants and electronic components in the RAC sector.

Researchers at The Energy and Resources Institute (TERI) carried out field surveys amongst servicing technicians across cities to identify the existing status of servicing sector preparedness when embracing the new refrigerant transition. The findings of the research indicate there are factors that make them vulnerable to the impacts of toxic and flammable refrigerants. The survey results reveal that a majority of service professionals entering the RAC service field do not get formal vocational training. They learn in the field from their seniors who they mostly called "Ustads – an honorific title for the expert of the field". In today's changing world, where higher-tech RAC equipment are hitting the market with new the refrigerants, including flammable and high-pressure refrigerants, refresher courses come with its own priority where already trained technicians are imparted updated training. Regardless of the existing training programmers, a huge number of technicians now working in the industry, still need trainings. The Survey results also show that few service technicians recover refrigerants at the end of its lifespan or when servicing the equipment.

Further, service technicians are required to be equipped with the refrigerant and their safety gear during servicing, transportation handling and storage etc. A large pool of current service technicians lack these understandings and are prone to safety risks.

Benefits of Training and Certification

The up-gradation in the skills and certification of servicing technicians would prepare them to address the issues related to servicing of RAC equipments, and enhance their employment opportunities to continue their stable and secure livelihoods.

Benefits of Training and Certification

CALENDAR OF RAC TECHNICIANS TRAINING-PROGRAMS ON GOOD SERVICE PRACTICES INCLUDING INSTALLATION OF ROOM AIRCONDITIONERWITH HCFC-22 AND FLAMMABLE REFRIGERANTS

State	Training Partners	Training Dates	City	Partner Details
		17 - 18 Sep 2022	Mahaboobnagar	
		21 - 22 Sep 2022	Ongole-Kandukoor	
		23 - 24 Sep 2022	Gudoor-Nellore	
Chandigarh	Anant Enterprises	16 - 17 Sep 2022	Jammu	Anant Wadhwa Office: Shop No. 782/15, Khalsa Market, Opp. Community Centre, Gobind Pura, Manimajra Mobile +91 98123 02544 E-mail ID: dj.anant@ymail.com
		18 - 19 Sep 2022	Kathua	
		23 - 24 Sep 2022	Roorkee	
		25 - 26 Sep 2022	Haridwar	
		01 - 02 Oct 2022	Una	
		07 - 08 Oct 2022	Bhiwani	
		09 - 10 Oct 2022	Jhajjar	
		14 - 15 Oct 2022	Chandigarh	
		16 - 17 Oct 2022	Fatehgarh Sahib	
		29 - 30 Oct 2022	Chandigarh	
Delhi	Key Path India Pvt Ltd	16 - 17 Sep 2022	Delhi	Mr. Rao Key Path India Pvt Ltd. Plot No: 143, 02nd Floor, F.I.E, Patparganj, Delhi - 110092 Tel : 011-49090613 Mobile: +919873001382 Email ID: rao@keypath.in keypathindia@gmail.com
		23 -24 Sep 2022	Delhi	
		30 Sep - 01 Oct 2022	Delhi	
		07 - 08 Oct 2022	Delhi	
		14 - 15 Oct 2022	Delhi	
		21 - 22 Oct 2022	Delhi	

State	Training Partners	Training Dates	City	Partner Details
Karnataka	Dewpoint Appliances(p) Ltd	15 - 16 Sep 2022	Bellary	Jessy Mathew No. 808, 10th A Main, 1st Stage, Indiranagar, Bangalore, 560 038 Mobile: +91984507594 E-mail ID: Dewpoint.blr@gmail.com
		17 - 18 Sep 2022	Bellary	
		19 - 20 Sep 2022	Raichur	
		21 - 22 Sep 2022	Raichur	
		23 - 24 Sep 2022	Kalaburagi	
		25 - 26 Sep 2022	Kalaburagi	
Madhya Pradesh	Divyansh Services	22 - 23 Sep 2022	Raipur	Anita Mishra Divyansh Services 19, Swadesh Nagar, Behind Ashoka Garden Police Station, Bhopal. Madhya Pradesh Pin-462023 Mobile-9826620890 E-mail ID: Arunmishra71@rediffmail.com
		24 - 25 Sep 2022	Raipur	
		01 - 02 Oct 2022	Bhilai	
		04 - 05 Oct 2022	Durg	
		14 - 15 Oct 2022	Nagpur	
		16 - 17 Oct 2022	Nagpur	
		22 - 23 Oct 2022	Jalgaon	
		29 - 30 Oct 2022	Bhusawal	
Maharashtra	Max Cooling Systems	17 - 18 Sept 2022	Goa North	Mathew Abraham, Max Cooling Systems 2. Butte Patil Residency, 363/5 Shivajinagar Pune 411005, Maharashtra Tel. 020- 25534737 Mob. 9422011095 E-mail ID maxcoolengg@yahoo.com
		24 - 25 Sept 2022	Chiplun	
		01 - 02 Oct 2022	Kolhapur	
		08 - 09 Oct 2022	Sangli	
		15 - 16 Oct 2022	Solapur	
		22 - 23 Oct 2022	Pandarpur	
Tamil Nadu	Sakthi Refrigeration & Air-conditioning Enterprises,	17 - 18 Sep 2022	Karaikudi	R. KamalaKannan, M/s Sakthi Refrigeration & Air- conditioning Enterprises, 0/1, Kanakkar Street,(Near) Venkateswara Theatre, Thiruvottiyur, Chennai- 600019 Mobile: 9840369337 E-mail ID: Kannan.r2805@gmail.com
		19 - 20 Sep 2022	Pudukottai	
		22 - 23 Sep 2022	Nagapattinam	
		25 - 26 Sep 2022	Neyveli	
		27 - 28 Sep 2022	Kallakuruchi	
		13 - 14 Oct 2022	Dharmapuri	
		15 - 16 Oct 2022	Krishnagiri	
		17 - 18 Oct 2022	Hosur	
		20 - 21 Oct 2022	Ambur	
Assam	Kuwality Coolers	20 - 21 Sep 2022	Guwahati	Mr.Devajit Talukdar/Mr.P.Mazumdar Kuwality Coolers, Add: House no. 232, A.T. Road, Kamakhya Gate, Guwahati, Assam - 781010 Mobile : +91 9957188906, +91 9864017889, Email ID: k.kuwalitycoolers@gmail.com kwalitycoolers@rediffmail.com
		24 - 25 Sep 2022	Bongaigaon	
		29 - 30 Oct 2022	Nagaon	

State	Training Partners	Training Dates	City	Partner Details
Uttar Pradesh	Isha Enterprises	19 - 20 Sep 2022	Ghazipur	Rajesh Mishra, Isha Enterprises Address: Isha Enterprises 116, Faizabad Road, Near I T College Metro Station, Lucknow - 226 007 (U.P.) Mobile: +91 9415024423, 9956297523 E-mail ID: Isha.enterprises@rediffmail.com
		21 - 22 Sep 2022	Balia	
		23 - 24 Sep 2022	Ambedkar Nagar	
		27 - 28 Sep 2022	Raebareli	
		29 - 30 Sep 2022	Raebareli	
		03 - 04 Oct 2022	Jaunpur	
		05 - 06 Oct 2022	Jaunpur	
		07 - 08 Oct 2022	Mau	
		17 - 18 Oct 2022	Bareilly	
		19 - 20 Oct 2022	Moradabad	
		21 - 22 Oct 2022	Shahjahanpur	
Gujarat	Kirti Freeze	17 - 18 Sep 2022	Ahmedabad	Naranbhai M Patel, Kirti Freeze / Zeel Power Systems / Kirti Freeze Off-No.1, Ghadhvi House, Nr.Ramji Mandir, B/h. Navrangpura Policestation, Navrangpura Gam, Ahmedabad-9. Mobile : 9825414212 / 9426301242 E-mail ID zeelpower@sify.com zeelwater@gmail.com
		24 - 25 Sep 2022	Ahmedabad	
Jharkhand	A.K.Enterprises	13 - 14 Oct 2022	Patna	Anil Kumar Pavithran A K Enterprises Plot No - D/6, Center Market Sector - 5, Bokaro Steel City Jharkhand-827006 Mobile: +919431379078,+918651020355 E-mail ID: chinchu_anil@yahoo.in
		15 - 16 Oct 2022	Bihar	
Kerala	V.R.Enterprises	17 - 18 Sep 2022	Karunagapally	V.Vijayakumar V.R. Enterprises 301, Akaria Arcade Ayyappan Kavu,Chittoor Road Ernakulam, Cochin - 682 018 Mobile: +919447464821 E-mail ID vijayakumar_vk54@yahoo.co.in
		19 - 20 Sep 2022	Karunagapally	
		22 - 23 Sep 2022	Punalur	
Rajasthan	Bohra Services	15 - 16 Oct 2022	Kota	Surendra Bohra Bohra Services 62-63, Gem Enclave, Setu Path, Pradhan Marg, Malviya Nagar, Jaipur, Rajasthan 302017 Mobile : +919414066848 E-mail ID: surendra.bohra@galaxyens.com surandrabohra@gmail.com
		17 - 18 Oct 2022	Kota	

IMPLEMENTATION OF RECOMMENDATIONS OF INDIA COOLING ACTION PLAN

By Aditya Narayan Singh, *Additional Director, Ozone Cell* ***and Fahad Naim,*** *Ozone Cell*

The India Cooling Action Plan (ICAP) was launched in March 2019 by the Ministry of Environment, Forest and Climate Change. The ICAP provides a 20-year perspective and outlines actions needed to provide access to sustainable cooling. The ICAP is in sync with India's commitment to the Montreal Protocol, 1987 (reduction of ozone-depleting substances) as well as the Paris Agreement, 2015 to meet the challenges of climate change.

Objectives

- Assessment of cooling requirements across sectors in the next 20 years and the associated refrigerant demand and energy use,
- Mapping of the technologies available to cater to the cooling requirement including passive interventions, refrigerant-based technologies and alternative technologies such as not-in-kind technologies,
- Suggest interventions in each sector to provide for sustainable cooling and thermal comfort for all,
- Focus on skilling of Refrigeration and air-conditioning (RAC) service technicians, and
- Develop an R&D innovation ecosystem for indigenous development of alternative technologies

Environmental and socio-economic benefits

- Thermal comfort for all – provision for cooling for Economically Weaker Section (EWS) and Low Income Group (LIG) housing
- Sustainable cooling – low GHG emissions related to cooling
- Doubling Farmers Income – better cold chain infrastructure – better value of produce to farmers, less wastage of produce
- Skilled workforce for better livelihoods and environmental protection
- Make in India – domestic production of alternative refrigerants production and manufacturing of air-conditioning and related cooling equipment.
- Robust R&D for development of alternative low-GWP refrigerants and cooling technologies – gives impetus to innovation in the cooling sector

ICAP also covers RAC servicing sector specifically with respect to usage of refrigerants, energy efficiency of in-use equipments, servicing practices, market growth, the need for training and certification, availability of training infrastructure, livelihoods and social security.Bettering training infrastructure will perhaps be the biggest contributor to improving the service sector based on ICAP suggested interventions to transition the servicing sector towards achieving the long-term environmental and developmental objectives.

India is the first country in the world to have a comprehensive cooling action plan, which was launched by the MoEF&CC in March 2019. The India Cooling Action Plan (ICAP) aims to provide an integrated vision towards cooling across sectors encompassing, inter alia, reducing cooling demand, refrigerant transition, enhancing energy efficiency and better technology options with a 20-year timeframe, i.e. 2037-38. Dovetailing energy efficiency of RAC equipment with refrigerant transition will enhance the overall climate benefit. Most importantly, synergistic actions, with respect to cooling across sectors, will have a higher impact than actions taken in isolation.

Towards operationalizing the recommendations for each thematic area, six thematic working groups namely (i) Space Cooling in Buildings, (ii) Cold Chain, (iii) Domestic manufacturing and Production Sector – Alternative Refrigerants and technologies, (iv) Servicing Sector, (v) Transport Air conditioning (car, bus, train and Metro Air conditioning) and (vi) Research and Development have been constituted under the Chairmanship of Joint Secretary (Ozone Cell), MoEFCC. Constituted by the Ministry this is to develop an implementation framework for the ICAP recommendations for each thematic area. A Steering Committee under the Chairpersonship of Additional Secretary (Ozone Cell), MoEFCC has also been constituted to guide and oversee the implementation framework.

With regard to reduction of cooling and energy demand in Space Cooling in the building sector, a list of action points have been finalised after mapping of the ICAP recommendations with the ongoing government programmes/ schemes of the various Ministries. Action Points have been published and circulated to the concerned Ministries/Departments/Agencies for implementation.

Action points relating to implementation of recommendations of ICAP for the cold chain has been finalized and circulated to the concerned Ministries/Departments/Agencies for implementation. Action Plan for the remaining four thematic areas has been initiated and will be finalized by October 2022.

MONTREAL PROTOCOL - KIGALI AMENDMENT

Kigali Amendment

India ratified the Kigali Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer on 27th September 2021.[1,2]

Benefits:

i. The phase-down of production and consumption of hydrofluorocarbons (HFCs) is expected to reduce greenhouse gas (GHG) emissions as HFCs are potent GHGs due to their high global warming potential (GWP). This would protect the environment, particularly the climate.

ii. HFCs are commonly used as refrigerants in RAC equipment. The RAC equipment manufacturers in the country will gradually phase-down the use of HFCs in manufacturing of new RAC equipment and other products.

iii. India is the second largest producer of HFCs. Producers of HFCs will also phase-down production of high-GWP HFCs.

iv. The production of chemicals as well as manufacturing using HFCs will transition to non-HFC and low GWP technologies.

Implementation strategy and targets:

i. National strategy for phase down of hydrofluorocarbons as per the phase down schedule for India will be developed in consultation with the industry stakeholders by 2023.

ii. Amendments to the existing legislation framework, the Ozone Depleting Substances (Regulation and Control) Rules, 2000 notified under the Environment Protection Act 1986 to enforce appropriate controls on the production and consumption of hydrofluorocarbons to ensure compliance with the Kigali Amendment for phase-down of HFCs.

Major Impact:

i. Hydrofluorocarbons phasedown is expected to prevent the emission of high GWP HFCs. It is estimated that phase-down of HFCs globally will result in avoiding up to 0.5 degree Celsius of global temperature rise by 2100.

ii. Implementation of HFC phase down under the Kigali Amendment through the adoption of low-GWP and energy-efficient technologies will achieve energy efficiency gains and carbon dioxide emissions reduction - a "climate co-benefit".

iii. There would be scope for domestic manufacturing of RAC equipment as well as non-HFC and low-GWP alternatives to HFCs to enable the industry transition to low global warming potential alternatives as per the agreed HFC phase down schedule. This would also provide opportunities to promote domestic innovation for new generation alternative refrigerants and related technologies.

1 https://treaties.un.org/Pages/ViewDetails.aspx?src=IND&mtdsg_no=XXVII-2-f&chapter=27&clang=_en#EndDec

2 https://pib.gov.in/PressReleasePage.aspx?PRID=1746946

INFORMATION ABOUT EQUIPMENT'S AND TOOLS FOR BETTER SERVICING

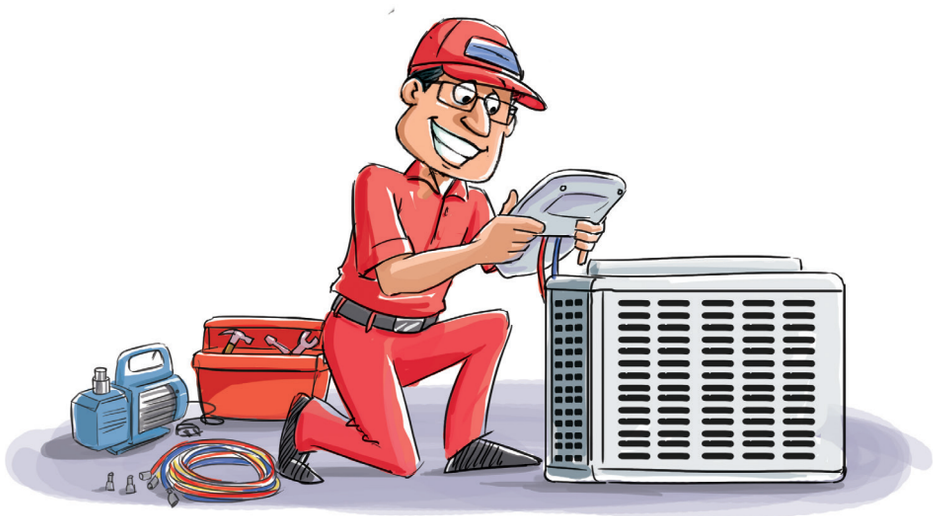
By C. J. Mathew, RASSS

Refrigeration and Air-conditioning service, as a trade, requires good service practitioners skilled in fields as diverse as mechanical, electrical and electronics. This means, that to be a successful technician, one has to gain understanding across these fields. Adding to this ever present challenge, the process of transitioning from HCFC to an alternative refrigerant presents a volley of hurdles as alternatives have higher working pressures, inflammability and issues with blends. Therefore, relatively higher levels of accuracy and concentrated attention to safety requirements are called for when one works with these alternate refrigerants.

HVAC systems have traditionally been focused on heating and cooling, however there is now a growing focus on energy efficiency with the rising concerns surrounding global warming. Attaining energy efficiency can only be done systematically, to do this one needs to have very good service practices. To ensure good service practices it is important to have the right tools and equipment of the trade. A proper use of good, well maintained equipment leads to an increase in the accuracy, reliability, responsiveness and therefore the credibility of the service technician. The old aphorism, time is money, holds true. Better practices paired with the right set of tools not only save time and money, they also reduce wastage of refrigerants and other consumables. While these are good benefits to have, there is an added gain for the service enterprise as these practices bring with them fewer repeat failures. With this also comes increased profitability for the organization and also longer lifespans of equipment. Further, this indirectly helps reduce the effects of global warming, while also bringing saving to customers in their electricity bills.

You may, already, be familiar with the typical wrenches, pliers, hammers, screwdrivers, mallets, vices, taps, twist drills, dies, chisels, hacksaws and files. However in RAC appliance repair, it is crucial to make sure that you are equipped with the proper tools required for the job. In this article we are introducing some tools and equipment that are necessary for good servicing of RAC appliances.

Images of Tools and equipment are taken from Technicians Handbook "Good Service Practices and Installation of Room Air-conditioners with HCFC–22 and Flammable Refrigerants" published by GIZ Proklima International.[3]



[3] https://www.green-cooling-initiative.org/fileadmin/user_upload/Good_Service_Practices_and_Installation_of_ACs_Trainer_Handbook.pdf

Tube cutter: Tube cutters are available for various diameter of tubing. They are used to make accurate 90° cuts on copper tubing. Adjust the cutting wheel to fit the copper tube, then spin the tube cutter around a few times. Gradually tighten the tool by rotating the handle wheel slightly to the required level and then repeat the process. Do not rotate the handle wheel too tight as it can damage the tube as well as the cutting blade. Always keep the wheel shaft, rollers and sliding parts well lubricated.

Capillary tube cutter: In order to avoid choking the system it is important to cut capillaries at an angle while ensuring that there are no burrs.

Capillary cutters are designed to cut capillaries at a 45 degrees angle without any burr in very little time. Do not use wire cutters instead of capillary cutter as wire cutters do not have angles inside the cutter to protect burrs and choking.

Tube bender (lever type): Bending soft copper tubing with diameters greater than 3/16" by hand can result in kinks in the tube. Hence it is important to use tube benders to make short radius bends. Lever type tube benders can be used to make short bends up to a range of 1800.

Deburring tool: Deburring tools are used to remove any burrs left behind while cutting the tube causing both the inside as well as the outside of the copper tube to be made smooth and clean.

Removing burrs are important as these small pieces can cause a system to malfunction if they get into the lines.

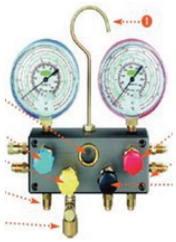
Flaring and Swaging tool: The flaring tool is used to spread the end of the tube outward to form a flare. It consists of a tube holding device called a flaring block along with a yoke assembly comprised of a feed screw and a smooth surfaced flare compression cone. The tubing is clamped in the flaring block with 30% of its diameter protruding, the yoke is engaged and the feed screw advanced until the process of flaring is completed.

The swaging tool is used to expand the inside diameter of a copper tube so that the resulting diameter is the same as the outside diameter. It is used to join two copper tubes of the same diameter.

For swaging clamp put the copper tube in the flaring block so that the outside diameter of the copper tube plus 3mm length is protruding above the block.

2 Way Gauge Manifold: This is mainly used to diagnose trouble in air-conditioning systems or during evacuation and charging operations. It contains two shut-off valves, three external connections, and two pressure gauges to measure both low side and high side pressures.

4-way Gauge Manifold: A 4-way gauge manifold has more ports (manifolds) to attach accessories to. Hence during evacuation and gas charging both vacuum pump and refrigerant cylinder can be connected at the same time. Using the 4-way gauge manifold will save time as there is no need to switch hoses for different processes thereby avoiding the need to purge the refrigerant.



Digital Clamp Meter: Clamp meters are multi-purpose test tool used for measurement of AC/DC voltage, continuity and resistance. Clamp meters have become popular as they can measure current in a circuit without disconnecting/deenergizing them. As an added bonus they are both safe and convenient to use.

Refrigerant recovery machine: Due to their adverse impact on the environment refrigerants should not be released in to the atmosphere. It is advisable, therefore, to recover and reuse refrigerants thereby making it important to have a recovery machine. While recovering different types of refrigerants, it is necessary to evacuate the recovery unit before connecting to a system with a different type of refrigerant. A recovery unit with an oil-less compressor will reduce the chances of cross contamination of refrigerants.

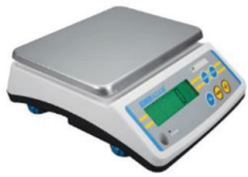
Refrigerant recovery cylinder: Due to the presence of contaminants, the recovered refrigerant pressure may be higher, hence it is advisable to only use recovery cylinders for the recovery and storage of recovered refrigerants. Separate recovery cylinders should be used for recovery of different refrigerants.

Vacuum Pump: It is very important that the refrigeration system should be evacuated before charging the refrigerant into the system. It is recommended to use a double stage vacuum pump (70 to 100 LPM capacity) equipped with a gas-ballast valve, capable of creating an ultimate vacuum down to 15 microns.

Vacuum Gauge: The vacuum gauge also called a micron gauge, is used to measure the vacuum being created while evacuating a system accurately. It is important to isolate the vacuum gauge before charging the refrigerant or introducing any positive pressure in to the system

Weighing Scale: A good quality digital weighing scale is required to charge an accurate quantity of refrigerants into a system, as doing so improves the performance of the system leading to the energy efficiency being maintained well.

It is advisable to have a CE certified weighing scale Platform type (225 x 300 mm), 20-25 kg capacity with Least count /accuracy of 1 or 2 g.



Electronic Leak Detector: While using a soap solution is an excellent leak detection method due to it being cheap and common however in larger systems it is difficult to determine the exact location of the leak. Hence Leak detectors are better suited to accurately locate leaks. It is to be noted that separate leak detectors are required for each type of refrigerant.	
Nitrogen cylinder with 2 stage regulator the usage of nitrogen is recommended to flush and leak test refrigeration systems. The pressure of nitrogen in a cylinder is typically above 2000 psi, and such pressures can cause serious accidents. Hence a 2-stage regulator must be used to regulate the output pressure to safe working limits of about 10-20 bar (145-290 psig).	
Crimping Pliers: Crimping pliers are necessary for fixing fastener clips to the end of a wire. These can also be used to cuts wire and strip wire. With increased use of flammable refrigerants it is necessary to ensure that the connections are made tight while preventing loose connections.	
Torque Wrench: A torque wrench is used to apply a specific torque to a nut and bolt or a flare nut and union, in order to ensure that it is tightened sufficiently while preventing it to be over tightened.	
Ratchet Wrench: The ratchet wrench is used to open and close cylinder valves. By design it will not damage the valve stem and ensure a proper sealing of the valve. A common mistake is to use an adjustable spanner to operate a cylinders valve spindle. This can damage the spindle and increases the likelihood of an accident.	

Jigar Panchal, aged 33 years, is an Ahmedabad based technician and also owns an authorised servicing center employing technicians to provide installation and servicing services to residential and light commercial Air conditioning consumers. Mr Panchal attended GIZ Training program in 2021 and learned lot of new things on training which was helpful to provide better servicing for customer.

From the field:

TERI team reached Mr Panchal to know about the current servicing practices adopted by him and improvements gained after the training.

What is the nature of your job?

Ans: I have been working in the field of RAC technician for more than 15 years after completing ITI and worked with various manufacturers servicing center. Now I own a servicing center employing several service technicians to do the installation and maintenance of air conditioners. I also visit the field some times to do the job.

Are you professionally trained? What trainings you have undergone i.e. ITI, GIZ, ISHRAE, Skill India etc. Have you heard about them before?

Ans: I have done diploma in mechanical engineering and ITI. Yes, I heard about the GIZ training and attended last year. It was very informative training session and I have learned about the good servicing practices and safe practices to be followed while doing the job to avoid the accident in the field. This training helps to do better servicing in the field.

What type of tools you carry for servicing job?

Ans: We generally carry basic tool-kit for any servicing and maintenance job which involves: screwdriver, temperature meter, clip-on meter, spanners head, gauge manifold, different type of charging line and different capacity capacitor etc.

Would you be interested in upcoming trainings to remain updated with the new technologies and refrigerants?

Ans: Yes, as the field of servicing is changing with the latest developments such as new technologies, safety measures and new flammable refrigerants. These training will help us to upskill and stay up to date.

What type of information do you require in the newsTRAC newsletter for service technician, any suggestion?

Ans: A large number of technicians undergo informal training by their superiors and on field knowledge. They are not aware of the new technologies and refrigerants and good servicing practices. The information about the same will help them to give better servicing.

GOOD SERVICE PRACTICES FOR ROOM AIR-CONDITIONERS

HPMP
HCFC Phase-Out Management Plan, Servicing Sector

RECOVER RECYCLE RECLAIM

RECOVERY OF REFRIGERANT FROM SYSTEM FOR REUSE IN THE SAME SYSTEM

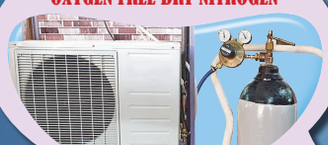
REPAIR/REPLACE DEFECTIVE PARTS WITH OEM PARTS

PROPER BRAZING &/OR FLARING

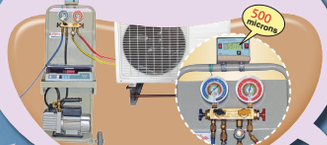
CLEANING/ POLISHING AND FLUSHING WITH OXYGEN FREE DRY NITROGEN

Committed to **Quality Service**
Committed to **The Environment**

LEAK/ PRESSURE TESTING WITH OXYGEN FREE DRY NITROGEN



EVACUATION AND VACUUM HOLDING



Boiling Point of Water °C	Vapor Pressure in Microns
100	7,59,968
50	92,456
30	31,750
10	8,641
0	4,572
-10	1,722
-23.35	500

Our aim 500 microns

SEALING PROCESS TUBE/CLOSING VALVES

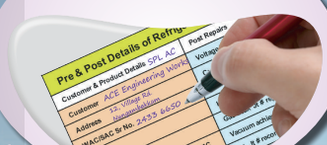
REFRIGERANT CHARGING BY WEIGHT

SAFETY ALWAYS

SAVE OUR OZONE LAYER

CHECK FOR PROPER OPERATION AND FINAL LEAK CHECK

RECORD DETAILS OF WORK DONE



HPMP PHASE-OUT MANAGEMENT PLAN : SERVICING SECTOR

A Project of the Ozone Cell, Ministry of Environment & Forests (MoEF), Government of India in co-operation with the Government of Germany represented by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH and United Nations Environment Programme (UNEP)

giz

UN environment programme

www.ozonecell.nic.in

New Initiatives from Ozone Cell

The Ozone Cell, MoEF&CC, in association with the United Nations Environment Programme (UNEP) has been implementing the enabling component of HCFC Phase-out Management Plan (HPMP) Stage-II, as part of which the following studies have been commissioned:

i. Study on Good Management Practices for energy efficient buildings by introducing Passive Cooling designs, to reduce operational costs, improve health and comfort and promote use of non-HCFC and low-GWP alternatives in association with Construction Industry Development Council (CIDC).

ii. Study on Good Management Practices for Cold Storage (warehouse) infrastructure used in e-commerce - business highlighting application of non-HCFC and low Global Warming Potential (GWP) refrigerant based energy efficient cooling systems in association with Pricewaterhouse Coopers India Pvt. Ltd. (PWC).

iii. Study on Public Procurement policies for hiring trained and certified RAC service technicians in association with TERI.

iv. Development and circulation of Quarterly e-newsletter for RAC service technicians on the importance of good servicing practices including handling of different types of refrigerants, related safety issues and updates on refrigerant transition under the Montreal Protocol in association with TERI.

In addition, the following activities under the enabling component are being undertaken:

a) An MoA has been signed between Ozone Cell, MoEF&CC and the National Academy of Customs Indirect Taxes and Narcotics (NACIN) for activities related to Customs and Enforcement capacity building comprising training of trainers, capacity building workshops for customs and enforcement officers, border dialogue with neighbouring countries on specific ODS trade related aspects. In addition the field customs formations are also being sensitized through NACIN on the prohibition of HCFC 141 b imports in the country.

b) An MoA has been signed with Ozone Cell, MoEF&CC and Energy Efficiency Services Limited (EESL) for activities related to energy efficiency in RAC Service sector comprising development, publishing and dissemination of awareness material on linkage of energy efficiency and servicing practices for RAC products and to promote energy efficiency impacts of RAC products amongst the end-users and RAC service technicians.

Ministry of Environment, Forest & Climate Change
Government of India

For further information

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