ECO-COOL™

BULLETIN FOR REFRIGERATION TECHNICIANS

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Editorial

The National CFC Consumption Phase-Out Plan (NCCoPP) welcomes new readers and thanks the readers who have been receiving and reading the newsletter for the past 4 years for their interest and contributions. You may find some changes in this edition, as the newsletter is now funded and supported by the UNEP awareness component of the project under NCCoPP. The project target now extends beyond the technicians servicing small domestic refrigeration and air-conditioning systems, to encompass the servicing of car air-conditioning and open type compressors. It will also reach out to large organisations such as the Indian Railways. Eco-Cool remains focused on providing service technicians with useful information. We look forward more and more to your contributions, to hearing about your experiences using alternative refrigerants and to your servicing problems, which our technical advisors will respond to. Project activities are well underway and many of our technician friends are already active participants in the project. Over 65 training programmes will have been conducted up until end March, reaching out to 1615 technicians. The training programmes are nearing completion for this season. However, technicians who require training should contact their local training cell organiser or the Regional Management Organisation to indicate their interest. If there is sufficient interest programmes can start once the demand from more than 24 technicians is received and funding is available.

We include announcements of some important events which have taken place in NCCoPP recently. We continue to look at technical issues that pertain to the sector and include articles on diagnosing faults in sealed systems offered by a training coordinator who for many years was with one of the appliance manufacturing industries in India, as well as inside advice from the compressor industry on the correct way to select a compressor. The process of phasing out CFCs in India is rapidly accelerating with many events and activities taking place across the country. We bring you reports of the training programme for Customs officials as well as the pilot training workshop on good servicing practices in the Mobile Air-Conditioning (MAC) sector in which 29 technicians received training. Also a brief coverage of the

recent "Conference on Meeting Challenges in Phase out of CFCs from India's RAC Service Sector" where partners who had contributed to HIDECOR's successes and will continue to assure their guidance to NCCoPP met in Delhi to discuss the next steps. One of the successes of the NCCoPP Awareness generation team has resulted in over 30 articles in English dailies and local newspapers across India with the organisation and convening of journalists at 3 press meets. Some of you may have read these articles. We will be happy to hear your comments, queries and suggestions, which are always welcome as they will help us in making this newsletter truly effective. This newsletter continues to be published by IT Power India, as one activity which it is managing under the awareness raising contract that is held with UNEP. Many activities and events are under way now and will continue over the coming months to carry key messages to the servicing sector to help in phasing out CFCs in India (dealers and equipment support scheme workshops and press meetings, poster and leaflets etc.). Not least of these is a video to promote the needs of servicing technicians to transform their often wrong and indifferent servicing practices, get trained and bring their efforts to support that of the government, of national, state and private organisations and individuals, who are working to reduce CFC consumption in India until its total phase-out.

Please keep checking the NCCoPP website at www.nccopp.info for all new information or write to us at nccopp@itpi.co.in or tpm@itpi.co.in.

Dealers & Technician Corner

Dear editor,

I introduce myself as a trader in air-conditioning & refrigeration spare parts. I have been regularly following your efforts through the Eco-Cool magazine & congratulate you on the tremendous work your team is doing and wish the team success for future.

One thought that comes to my mind is how to spearhead, strengthen and give momentum to the work you are doing. There is a vital link of business flow, which is typical to the Indian market, a system of wholesaler –>retailer –>mechanic –>consumer with the number of operatives increasing as we descend the chain. A single wholeseller may cater to 20 retailers, each retailer catering to 100 different mechanics.

To propagate awareness to a larger audience about Ozone depleting substances, its effects on the environment and the remedial measures, I propose that a channel is developed, whereby we reach the retailers as our associates. In this way we will have more outlets of information and by coordinating twenty people we will have reached 2000 mechanics.

The retailers will thus become our ambassadors and act as an interface between NCCoPP and the mechanics and consumers at large .The flow of information will be two way, one by providing to mechanics easy access to information from the project, the other by informing the project about the mechanics' and consumers' requirements.

Given the right encouragement this channel will be highly effective. The idea is to bring information to society at large and who can do this better than the middle segment retailer, the only link between the manufacturer and consumer. Such a vital segment should be made USE of.

Mr Ashish Gupta, Spares & Refrigerant dealer, Standard Refrigeration & Elect.Engg. 3732, N.S.Marg, Daryaganj, New Delhi -110002

What you say to us

Respected Sir,

I received my first copy of your news bulletin Eco-Cool and I enjoyed it immensely. I have been working in this RAC sector for the last seven years. However it is only after reading your news bulletin and attending your training for reducing CFC in our work that I have begun to do the same and successfully too. The tips I got from reading your news bulletin have raised some questions in my mind and I would like to present these to you. This might help other RAC technicians like me not to face a similar problem.

- I charged a 134A Deep Freezer with gas. This equipment which already had 134A refrigerant had developed a leak. I repaired the leak and the POE oil that had become spoilt (moisture-free) was removed and replaced. There must still remain at least 10 gms or more of this spoilt oil in the Block-motor.
- Now will this oil by getting mixed with the new oil cause some problems in the system?
- How can one free the seal compressor from this spoilt POE oil?

I am waiting eagerly for your reply. Meanwhile accept my best wishes and many thanks once again for sending me this newsletter.

Mushtaq Ali, Sheetal Refrigeration, Main Road, Nal Sahabpura, Washim, Maharashtra

This letter has been translated from Hindi

ECO COOL response: Mr Mushtaq Ali's concern is well founded. Ideally it is always better to replace the Compressor with a new one charged with oil by the Compressor manufacturer. This is costly and mechanics tend to avoid this. There is always the possibility of a small amount of oil left behind in the old compressor which could have absorbed moisture apart from being contaminated otherwise. At least he should ensure that whatever oil is left behind in the other components of the system is flushed out as much as possible with Nitrogen. An additional safety is to use a new filter drier.

Contact: Mr R.S. Iyer, iyerus@vsnl.com

Dealers' meets

Meetings which invite dealers to share their views and hear about the technical, environmental and collaborative issues envisaged in the project have been held in Chandigarh, Jaipur, Indore, Lucknow, Kochi, Bihar, Bhubaneshwar and Dehra Dun. The meetings are followed by a dinner and usually lively interaction with project members.

One last meeting at Guwahati will be held on 20 March 2005 inviting dealers from the 7 North Eastern States, as well as a guest dealer from Bhutan to participate fully in the NCCoPP. They can do this by promoting training to their clients, by selling environmentally friendly products, including alternative refrigerants (HFC 134a and Hydrocarbon blends now available in India) and for registering as dealers of CFC products at the local administrative representative body (SISI or Pollution control board). At the moment more than 353 dealers have attended these meetings and are passing on the important messages to phase out CFCs from India as quickly as possible. The dealers will soon have their own page on the NCCoPP website where they can access and download relevant information, and consult the schedule of meetings which will be held in their state. Information can also be obtained by contacting nccopp@itpi.co.in, by writing to the editor of Eco-Cool or directly from the local Training Cell organiser (details to be found on pages 5 and 6).

Poster on Best Servicing Practices launched on 30 January 2005 at the Lucknow Dealers' meet

Dealers and RAC Servicing Enterprises interested in receiving a copy of the poster should write to ***the Editor, Eco Cool.***

Update on Equipment Support Scheme

In order to promote the Equipment Support Scheme workshops were held in Chennai on 5 November 2004 in Bangalore on 7 November 2004 and in Hyderabad on 8 November 2004. Expressions of interest were formulated by prospective RSEs and after individual interviews with these businesses, further EoIs were received and the lists consolidated. After verification and matching of criteria, a total of 341 EoIs were sent to UNDP, the implementation agency, from the 3 states for the different categories of equipment proposed under each package.

Newsflashes from NCCoPP

Conference on Meeting Challenges in Phase out of CFCs from India's RAC Service Sector

Inauguration of the conference by Hon. Thiru A Raja Minister of Environment & Forests

The aims of this important conference which took place at India Habitat Centre, New Delhi on 9 March 2005 were to share the experiences of implementing the HIDECOR project and to mark the official launch of NCCoPP. Guidance and financial support to HIDECOR had been provided by the Governments of India and Switzerland, whilst NCCoPP funding comes from the Multilateral Fund of the Montreal Protocol with bi-lateral implementation from the Governments of India, Switzerland and Germany. The presence of representatives from multilateral agencies UNDP, UNEP and UNIDO marked their contribution to the new project. The meeting was inaugurated by honourable Thiru A. Raja, Minister of Environment and Forests of the Government of India. Mr Julius Georg Luy, Minister, Embassy of Germany and Mr Olaf Kjelsen, Minister and Deputy Head of Mission, Embassy of Switzerland participated in the inaugural session indicating the strong commitment and determination of the three governments to support the phase out CFCs in India. Representatives of the Refrigeration industry, of international agencies and national organisations highlighted the experiences emanating from the highly successful HIDECOR project and noted the challenges which lie ahead in implementing and achieving targets under NCCoPP. The keen initiative of the new Director, Ozone Cell, Dr A. Duraisamy brought together more than 170 participants including important stakeholders involved in the process of phase-out of CFC consumption in RAC service sectors. Guidance in planning the event had been provided by Prof. Dr. R.S. Agarwal, IITD and Veena Joshi, SDC. The meeting was preceded by half a day of discussions where the Organizers of the 14 Training cells shared their experience in implementing training programmes. The active discussions pointed to improvements which could increase the efficacy of training programmes and reach out to recruit more and more technicians for training in order to reach the government's target to reach zero CFCs in India by December 2009.

NCCoPP Project Partners

MAC PILOT TRAINING PROGRAMME

A pilot training workshop on good servicing practices and retrofitting of Mobile air conditioning systems using HFC 134a and HC refrigerants was recently held in Bangalore at Dewpoint Appliances. The workshop was held during two separate day sessions, with a total of 29 participants, with theoretical sessions held in the morning and practical in the afternoon. The participants, drawn by direct contact with both formal and informal workshops in the Bangalore area, are presently installing and servicing mobile air-conditioning systems and have been doing so for a period varying between 5 and 20 years. This is the first workshop of its kind under NCCoPP and the experience will be repeated based on the enthusiastic feedback of the participants. The doubts felt by many technicians with regards the use of Hydrocarbons such as Hychill Minus 30 were dispelled by its ease of utilisation and the low cost of retrofitting. Greater care is needed with the use of HFC 134a as well as changes in some of the systems components. The workshop was led by Prof. RS Agarwal from IIT Delhi, Mr R.S. Iyer and Mr C.J. Mathew of Dewpoint Appliances. The team had also developed the materials for training. It is estimated that in the Bangalore area 100-200 technicians are presently servicing mobile air-conditioning systems and this number is probably on the increase.

Contact: Mr C.J. Mathew, Dewpoint Appliances, Cjmathew@vsnl.com

NEWSFLASHES ON CFC PHASE OUT IN INDIA

A training of trainers programme for officers from the Directorate General of Foreign Trade, Coast Guards and Customs, as well as officers from Bhutan was held at the National Academy of Customs, Excise and Narcotics (NACEN) on 17 and 18 February 2005. This 2 day programme focused on the harmful effects of Ozone depleting substances, the Montreal Protocol which determines internationally the use and trading of ODS, the trends and types of illegal trading of such substances and the actions to be taken. The programme covered the role of customs officers and other government agencies in regulating ODS flow, within the States and at the borders. Officers received training in using test kits to detect CFCs, which will be put in place in India in the coming months.

Contact: *Mr. V.K.Singh Kushwah, Additional Director General, NACEN, email adgnacen@yahoo.com*

NEWSFLASHES – NEW OZONE LOSSES... IN THE ARCTIC

The first signs of ozone loss have now been observed in the Arctic this winter, and large-scale losses are expected to occur if the cold conditions persist. Overall temperatures in the ozone layer are the lowest for 50 years, having been consistently low for the past two months. Since late November, large areas of polar stratospheric clouds have been present in the ozone layer over the Arctic region at altitudes around 20 km. They are now the largest in the last 20 years.

For more information, see: http://www.ozone-sec.ch.cam.ac.uk/scout_o3/

GETTING TECHNICAL! TIPS FROM INDUSTRY

Compressor HP a misnomer

Selection of a compressor on HP (Horse Power) basis for a Refrigerator could spell trouble. Horse Power of a compressor motor is the motor power output it delivers under a certain operating condition.

Compressors are designed to operate over a wide evaporating temperature range, intended to serve different applications e.g. a Low Temperature Model Compressor designed to operate over an evaporating temperature of (-) 28.9°C to (-) 6.7°C may serve a refrigerator, an ice cream storage cabinet, a scientific cooling equipment and so on. The motor output will be different in these applications, as the operating pressures are different. The nominal HP, if at all published by manufacturers, is not intended to be used for compressor selection.

The correct method of selecting a compressor for a refrigerator is by referring to the cooling capacity of the compressor at standard rating conditions (IS 10617 Part-I). We will take an example to further understand this point:

A single Door, 165 Lit Refrigerator requires approximately 90 Watts (300 Btu/hr) cooling capacity. This compressor is referred as 1/7 HP by some technicians and 1/6 HP by others depending on which make and model appliance / compressor is being referred to. Referring to the compressor by HP, there is every possibility that a technician asking for a 1/6HP for a 165 Lit Refrigerator, may be served a higher capacity compressor, say a 105 watts (360 Btu/hr) cooling capacity, by the Dealers / Traders who will go by how their principals refer to that model compressor. Using a higher capacity compressor in a lower capacity appliance will lead to unbalanced system operating conditions and results in higher power consumption as well.

One has to remember that the technician is paying a little more as well for this higher capacity compressor, by referring it by HP. Today various brands and models of compressors for use in refrigerators are available with a wide range capacity, in steps of 15 to 30 watts (50 to 100 Btu/hr) incremental capacity.

In order to get the benefits of (1) lower price, (2) lower energy consumption and (3) reduced service calls during the warranty you offer to your customer, it is wiser to select a refrigerator model compressor by its cooling capacity.

Contact: Mr K. Raghavan, Manager - Business support, Kirloskar Copeland Ltd, raghavan@kircop.com

Diagnosing Defects In A Sealed System

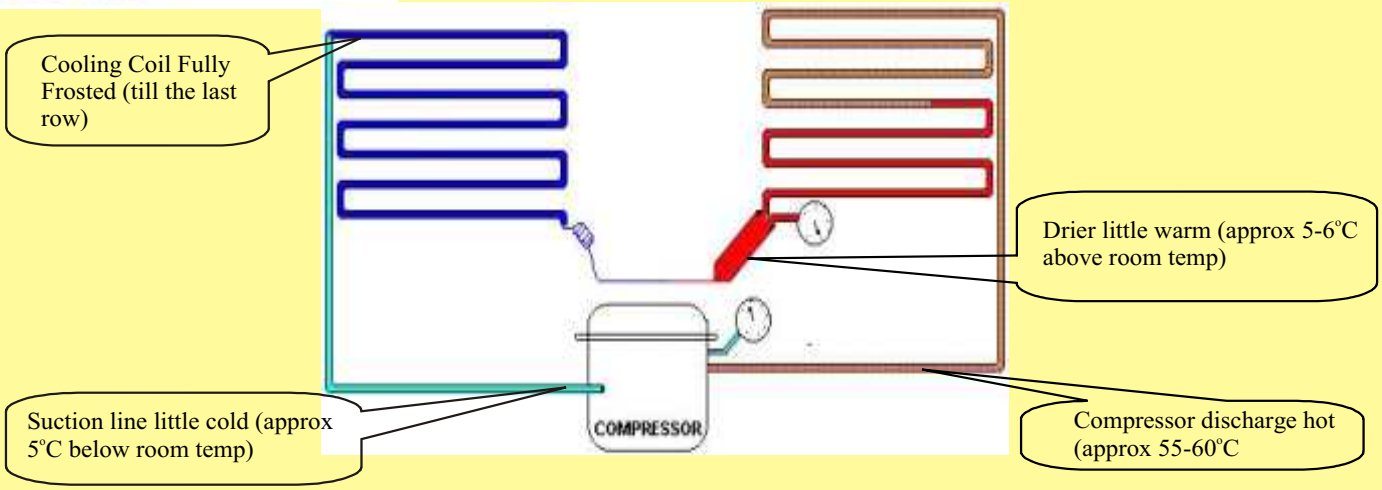
Normally a sealed system, which was running for some time will not go bad if it is not repaired recently or damaged physically.

Quite often, technicians fill refrigerant into a sealed system without proper analysis /diagnosis of the causes of the apparent defect of the system. This results in a wastage of gas, money and manpower and also damage to the Ozone layer if the refrigerant is vented. In this article, we shall first see the signs and manifestations of a healthy system and how that changes when the system is a defective one.

Other than electrical or mechanical problems to the compressor, the problems one can find in a sealed system are:

- Leaks
- Chokes
- Under Charge
- Over Charge

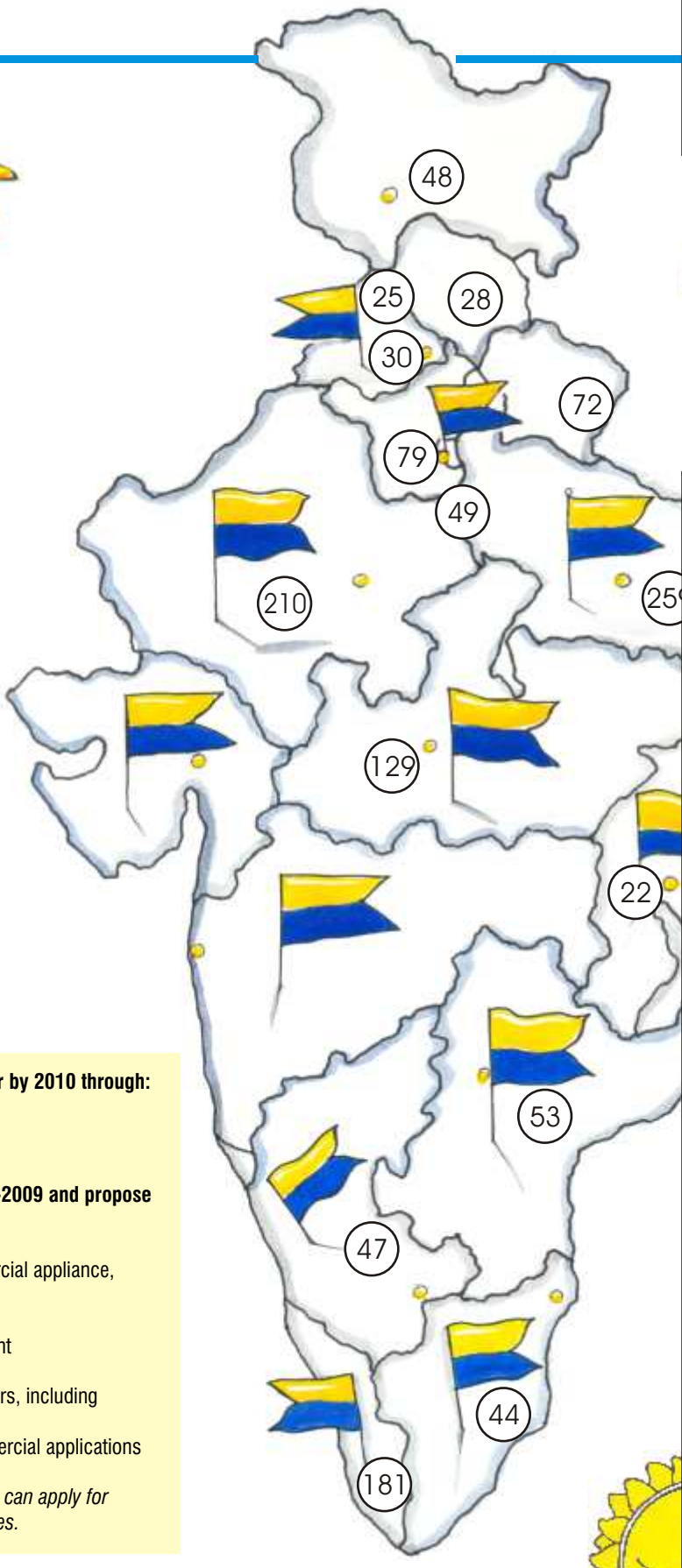
The following table gives some help to refrigeration technicians on various parameters to understand a defect in the sealed system.



	Normal	Leak	Choke (Partial or Complete)	Over Charge	Under Charge
Evaporator	Fully Frosted	No Frost or Hardly any Frost	Thin Frost or no frost	Heavy Frost	Thin Frost
Compressor Discharge	Hot (Approx 55-60^0 C)	Less Hot	Initially hot and slowly comes down	Very hot	Hot (Approx 55-60^0 C)
Drier	Little Warm (Approx 5-6^0 C above room temp)	At room temp	At room temp	Warm	At room temp or little warm
Capillary	Little Warm or at room temp)	Little Cold or at room temp	Little Cold or at room temp	Warm	Little Cold or at room temp
Suction Line	Little cold (Approx 5^0 C below room temp)	Warm (Approx 5^0 C above room temp)	Warm	Cold or Frosted	Warm (Approx 5^0 C above room temp)
Current	Normal (Rated)	Less then Normal	Less then Normal (it will be more if the choke is at compressor discharge)	More then Normal	Less then Normal
REMARKS		The leaks are found normally on the joints and the oil comes out from leak place	Most likely sites are capillaries and certain brazed joints, such as the joint at the Capillary inlet end and driver outlet if brazing has not been done with care	The compressor is abnormally loaded & makes more noise.	The last coil of evaporator will not be frosted properly.

Many of the symptoms shown are common for the various causes cited. The above table therefore gives an overview and a macro level approach to list the possible causes of poor performance by pure observation and feel. Using a thermometer with a proper surface probe may be useful for this exercise.. Beyond this and to be able to pinpoint the causes, the use of pressure gauges to measure the suction and discharge pressures is recommended. Use Piercing Valves/Pliers to access the sealed system and to connect the gauges.

Contact Mr Ashutosh Agrawal, ATS-India: ats-india@indiatimes.com



Training Contacts and Coverage :

The following organisations manage all training under the training cells in Tamilnadu, Andhra Pradesh, Karnataka, Kerala, Maharashtra, Gujarat, Chandigarh, Rajasthan, Uttar Pradesh, Madhya Pradesh, Greater Delhi, West Bengal, Bihar, Orissa, Assam and Chattisgarh

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Godrej & Boyce Mfg Co. Ltd. (Appliance Division):
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NCCoPP Contributes to the Phase-out of CFC in the RAC servicing sector by 2010 through:

- Targeting CFC-Consuming RAC servicing sector firms
- Encouraging good servicing practices for CFC-based appliances
- Training the servicing sector in handling new non-CFC technologies

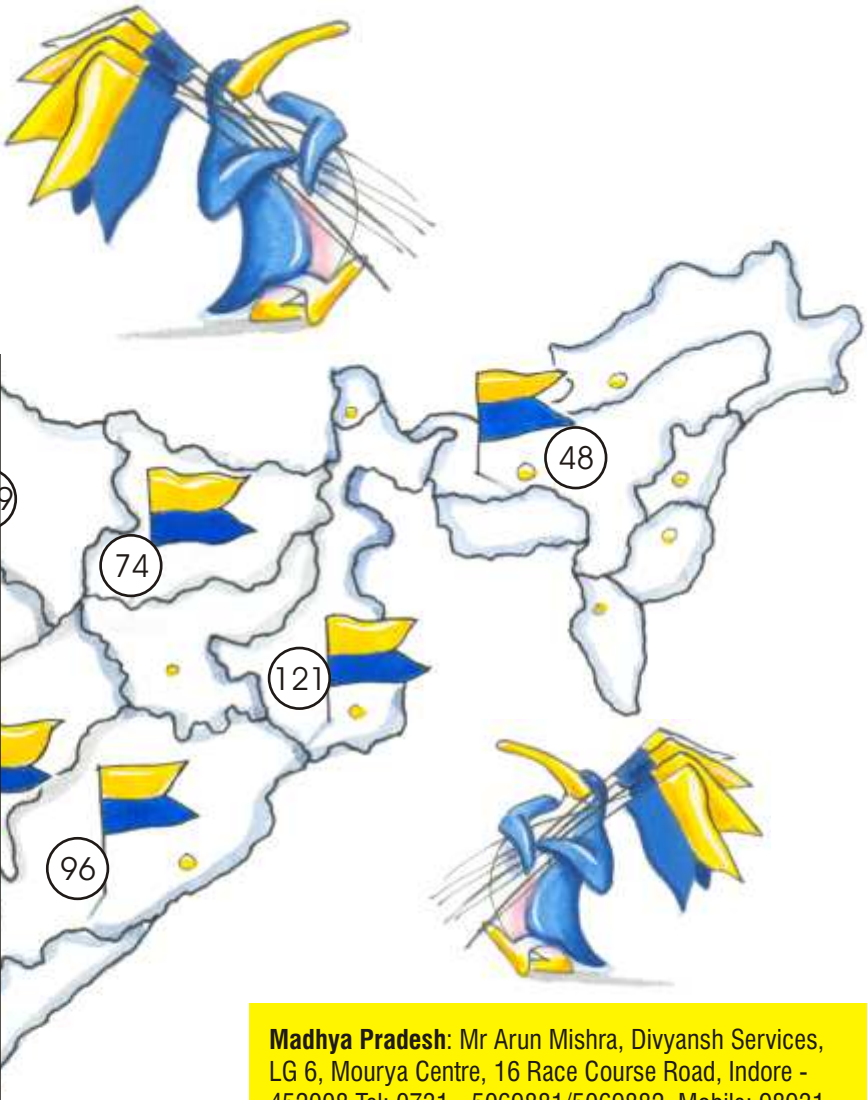
NCCoPP 2 day practical training programmes are scheduled from 2005-2009 and propose to cover:

- the CFC and ODS phase-out process
- servicing new HFC-134a and HC-based refrigerators and other commercial appliance, including retrofitting.
- "Recovery & Recycling" (R&R) of CFC refrigerants
- updates on technology and market changes, appropriate tools/equipment
- best practices in servicing of Mobile Air-Conditioning (MAC);
- retrofitting for large commercial appliances using open-type compressors, including retrofitting;
- Good Servicing Practices and review of retrofit options for larger commercial applications that use Open type compressors;

All MSE domestic and commercial refrigeration service-sector technicians can apply for training. Specialised 1 day trainings will be held for MAC service Enterprises.

* Numbers on the Map are approximate and indicate technicians trained until end March 2005

Training Partners



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BOOK POST

The earlier you switch over from CFCs to more environment friendly options the better !

CFCs will no longer be available in India from January 2010 !

The first year's training programmes were completed in March 2005.
These covered 17 states and 2 union territories all over India as marked on the map on pages 5 and 6.
The next session of training programmes will commence shortly. Those interested in enrolling can visit the website www.nccopp.info or contact any of the Training partners listed on the same pages for further information.

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