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Final Report

National CFC Recovery and Recycling Scheme 'Provision of Refrigeration and Refrigerant Handling Training Services in the Philippines'

Project No MP/PHI/97/097
Purchase Order No 15-8-1095X

This forms the final report of the above project which was carried out by Ellis Training Consultancy Ltd in the Philippines as follows:

June 3 1999 Arrival in the Philippines
June 4 1999 Meetings with UNIDO Programme Officer – Ms B Koreh, DENR and Executive Director of TESDA Mr Carlos Gallekaneo
June 7 – 11 The first batch of Trainers from TESDA were trained and certificated at the Taguig Regional Training Centre, Manila.

The training programme was conducted as per the attached programme with a high practical content (60%). Participants were given a pre training assessment and a post training assessment and the results of this process are attached for consideration. At the end of the training programme the participants were issued with a completion certificate by TESDA on behalf of UNIDO, DENR and TESDA. Each of the participants were also awarded a certificate by Ellis Training & Consultancy Ltd to confirm their readiness to impart their skills and knowledge to other trainers and to the Trainees/Technicians attending the National Certification Programme that can now take place.

June 14 – 18 The second batch of Trainers from TESDA were trained and certificated at the Taguig Regional Training Centre, Manila.

Training followed the same pattern as before with all of the participants having the opportunity to be involved in the installation, commissioning, testing and running of a small commercial refrigeration system (supplied by UNIDO). For a large proportion of the trainers involved in this programme this was a new experience, many of them had only previously been involved with the theoretical and practical aspects of small domestic refrigerators and freezers, window air conditioning units and auto air conditioning systems. Consequently the opportunities presented by this training programme were extremely useful and beneficial in improving the trainers understanding of the problems presented by ozone depletion and global warming.

All trainers had sufficient opportunities to practise recovery and recycling using the Van Steenburgh RV220 machine. This machine was undoubtedly an extremely good choice for the Philippines with its simple operation and low maintenance characteristics. The trainers quickly realised the advantages offered by recovery, recycling and re-using refrigerants in order to reduce emissions to atmosphere.

By the end of the second training course in Manila it was clear that the format was right, the participants were very enthusiastic about reducing refrigerant emissions and

would return to their provincial and regional training centres to carry out the technician training for the National CFC Recovery and Recycling Certification Programme with confidence.

The second batch of two Train the Trainers programmes were scheduled to take place at the TESDA Regional Training Centres at Cebu, and latterly at Davao.

July 5 – 7 The third batch of trainees from TESDA were trained and certificated at the Cebu Regional Training Centre and the Hotel Sarosa.

To this end John Ellis travelled out to Manila and then on to Cebu ready for the first of these programmes which commenced with an opening ceremony at the Sarosa Hotel, Cebu. After this ceremony the training commenced following the by now established format of 40% in the training room and then 60% (3 days) in the Regional Training Centre Refrigeration and Air Conditioning Workshops. The two small commercial refrigeration training systems were installed under close supervision and utilising the practices taught during the first part of the training programme. Nitrogen was used to pressure and leak test before the systems were evacuated and charged. The thermostatic expansion valve superheat was adjusted and the low pressure and high pressure switches were set up. Now the delegates were able to practice recovery and recycling using the Van Steenburg RV220. All delegates practised using the recovery/recycling machines over the 4th and 5th days of the training programmes.

During the training workshops all delegates were given instruction on improvising a recovery machine from a used or 'second hand' condensing unit. Together with advice and guidance on how to set up a local recycling network with air conditioning and refrigeration workshops in the vicinity of the Regional Training Centres.

When the training programme in Cebu was concluded with its closing ceremony, John Ellis relocated to Davao.

July 11 –14 The fourth batch of trainees from TESDA were trained and certificated at the Davao Regional Training Centre.

The fourth and final Train the Trainers course took place in the TESDA Regional Training Centre, Davao City. All the Regional Training Centres are similarly equipped and after two days instruction on the basic principles, refrigerants, retro-fitting, retro-filling and good installation practice, the delegates commenced the installation of the two basic small commercial refrigeration systems. These installation processes proved to be very popular parts of the practical programme and were essential to allow the delegates to practice using the access equipment, service gauge manifold sets, leak detection equipment and to gain the necessary experience with the recovery and recycling equipment.

At each of the training workshops much welcome support was given by personnel from NITVET, Manila which enabled maximum use of the training time by John Ellis. The workshops were equally successful and there is no doubt that the delegates will be able to instruct their students/technicians in the recovery, recycling and re-use of refrigerants.

The delegates to the Train the Trainers workshops came from mixed backgrounds and although some of them had never worked with refrigeration and air conditioning equipment, indeed some of them were not (up until the time of their attendance at the workshops) refrigeration teachers, there are sufficient experienced teachers, particularly at the larger regional centres and in the NITVET staff to ensure the success of the Technician training and National Certification Project.

All delegates were given instruction in delivering a one day course for technicians and John Ellis worked with NITVET staff outside the programme to help them develop a training programme, training manual and pre and post training assessments which were issued by TESDA to each of the Train the Trainers delegates for use in their delivery of the National Certification Programme.

TESDA is an impressive and efficient organisation with very enthusiastic and committed staff. It is certain that they will implement the National Certification programme for technicians without major problems and this will be due in no small measure to the commitment, enthusiasm and dedication of their staff, NITVET and in particular the extremely strong Regional and Executive Directors of TESDA.

During the training programmes in the Philippines contact was made and maintained with the UNIDO Office in Manila and DENR personnel visited each training programme and got feedback from the delegates. Extremely good working relationships were developed between the consultant John Ellis and TESDA staff and Regional and Executive Directors and feedback from TESDA indicated that this part of the UNIDO project was considered successful. The technician certification programme was expected/scheduled to be completed by TESDA by the end of November 1999.

Consultation took place between City & Guilds, London, an international certification body and Ellis Training & Consultancy Ltd with a view of utilising the City & Guilds services in the Philippines, However in consultation with TESDA at the start of the Philippines phase of the project it quickly became clear that this would be an extremely expensive process and so the decision was taken to put in place a TESDA National Certification Programme and since TESDA is already the National Vocational Training and certification provider this was logical, cost effective for TESDA and with the major input of NITVET would ensure quality across the whole of the Philippines. NITVET provides in service training for refrigeration and air conditioning trainers on a regular up-dating basis and teachers who haven't attended this set of UNIDO sponsored training workshops cannot be involved in the National Certification Programme but additionally those teachers will attend regular up-dating and awareness raising programmes with NITVET.

Each trainer who attended and successfully completed the UNIDO Train the Trainers programme were provided with a certificate by Ellis Training and Consultancy Ltd and the results of the pre and post training assessment are attached for information.

Proposals for follow up action

TESDA plan to have certification of technicians complete by the end of 1999. It would be appropriate to follow this up with a visit from UNIDO or some other independent consultant to monitor progress and to review the effectiveness of the Train the Trainers workshops.

Regular updating and awareness raising seminars should be attended by all Trainers involved in this programme to ensure that there is no slippage into the 'old ways' and to provide continuous reinforcement.

National training programmes for Refrigeration technicians were to be modified to include Recovery, Recycling and Refrigerant Re-use as part of the normal process. NITVET staff with this responsibility should be provided with such assistance and support as is necessary for them to carry out this task.

In conclusion it is felt that this project was extremely valuable and all parties concerned will have benefited from it. The trainers who participated are in a much stronger position to support the DENR in its desire to reduce the emissions of Ozone Depleting Substances to atmosphere. The equipment provided will make a significant contribution over many years to the same end.

Training Programme

Day One

Pre assessment
Ozone depletion and environmental considerations
Overview of the Philippines CFC phase out programme
National Certification programme
Global warming issues
Review of basic principles
Hazards of refrigerants
Refrigerant overview - alternative refrigerants

Day Two

Safe refrigerant handling techniques
Leak detection and prevention
Good refrigeration practice when:-
- Charging
- Evacuating and dehydrating systems
- Fault diagnosis and repair

Retrofitting and retrofilling to alternative refrigerants

Day Three

Recovery machines - techniques and principles
Recycling machines - techniques and principles
Recovering liquid and vapour
Recycling contaminated refrigerant
Maintenance techniques which minimise the loss of refrigerant to atmosphere

Day Four

Construction of simple recovery machines from recycled components
Practice installation, service and maintenance techniques
Practice recovery and recycling techniques
Practice retrofilling using alternative less harmful refrigerants

Day Five

Instruction on how to deliver a one day intensive course leading to certification
Assessment techniques and procedures
Post training assessments

Training Assessment

Manila 7th – 11th June 1999

NAME	PRE-TEST	POST-TEST	Improvement
Famy L Pepito	14	17	3
Juanito Labasam	6	21	15
Crispin M Yelasco	5	18	13
Saturnino M Ventura	3	24	21
Fraizer Kimmayong	10	14	4
Napoleon D Manding	7	20	13
Alexander T Restauro	9	26	17
Arturo G Gañalon	7	26	19
Eugene I Pomess	12	27	15
Manuel P Azucena	19	30	11
Eduardo B Alminiana	0	17	17

Manila 14th – 18th June 1999

NAME	PRE-TEST	POST-TEST	Improvement
Froilan Dumlao	4	26	22
Conrado L Mendoza	5	26	21
Alfredo G Cardinales	5	24	19
Bernado S Dizon	2	23	21
Herbert N Burabod	8	26	18
Jerry L Esnara	10	25	15
Felix M Vicente	12	27	15
Brent D Napat-a	7	20	13
Andres F Cabalu	6	23	17

Training Assessment

Cebu 5th – 9th July 1999

NAME	PRE-TEST	POST-TEST	Improvement
Rimer B Diolata	12	16	4
Reynaldo R Rosillo Jr	8	30	22
Castor N Bolofer	2	26	24
Danilo T Cabili	12	26	14
Henry B Supilanas	15	27	12
Ariel A Emmanuel	12	21	9
Porferio C Celestial	20	29	9
Carmelo A Luzon	14	26	12
Edgar L Majumot	6	17	11
Ma Juna C Sarroza	2	20	18
Victor B Villamor Jr	13	22	9
Kenneth L M Cañizares	3	18	15
Dougla A Aniñon	11	30	19

Davao 12th – 16th June 1999

NAME	PRE-TEST	POST-TEST	Improvement
Edilberto R Tamiok	3	30	27
Sambas I Hassan	9	27	18
Rafael L Masalta	7	25	18
Paulo S Villarojo	6	25	19
Carlito L Mahinay	12	27	15
Ishmael Amin	13	27	14
Tomas C Gomez	11	29	18
Bangon S Sumonsang	10	25	15
Edmundo L Labutap	15	30	15
Gil A Arnaiz	9	25	16
Froy Vil Joseph M Tagle	5	18	13
Mario T Antonio	11	24	13
Apollo C Oropesa	9	25	16
Ruben T Carduza Jr	5	29	24