



TOGETHER
for a sustainable future

OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.



TOGETHER
for a sustainable future

DISCLAIMER

This document has been produced without formal United Nations editing. The designations employed and the presentation of the material in this document do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations Industrial Development Organization (UNIDO) concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries, or its economic system or degree of development. Designations such as “developed”, “industrialized” and “developing” are intended for statistical convenience and do not necessarily express a judgment about the stage reached by a particular country or area in the development process. Mention of firm names or commercial products does not constitute an endorsement by UNIDO.

FAIR USE POLICY

Any part of this publication may be quoted and referenced for educational and research purposes without additional permission from UNIDO. However, those who make use of quoting and referencing this publication are requested to follow the Fair Use Policy of giving due credit to UNIDO.

CONTACT

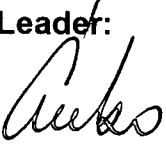
Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

22967

FINAL REPORT

Project No.: MP/CRO/99/097
Project Title: REFRIGERANT MANAGEMENT PLAN
Activity Code: 460D31
Contract No.: 2000/009 AMENDMENT A

Project Leader:

Tonko Ćurko, Ph.D.



Vjera Krstelj, Ph.D

Zagreb, February 2003



SYNOPSIS

This paper presents the Final Report on Training Courses for Service Technicians as indicated in the Paragraph 1 of the Contract No. 2000/009 AMENDMENT A.

Considering Contract No. 2000/009 CTT as Contractor considers all services completed.

The total number of the trained groups is 16, and of the technicians that have attended to the training is 186. Total figures are bigger than it was foreseen in the contract.

TABLE OF CONTENTS

- 1. INTRODUCTION**
- 2. TRAINING CENTERS**
- 3. WRITTEN MATERIALS**
- 4. TRAINING OF TECHNICIANS**
 - 4.1 Execution of training courses**
 - 4.2 Certificates**
- 5. TOTAL FIGURES**
- 6. CONCLUSION**

- ATTACHMENT** 1. List of service technicians

1. INTRODUCTION

Final Report considers all relevant data for the execution of the Contract No. 2000/9 AMENDMENT A. The purpose of the project is introduction of the good refrigerant management practices in Croatia among professionals dealing with halocarbon refrigerants, either by handling them directly or indirectly by operating systems that are charged with them.

For the training, written materials were prepared in training center Zagreb.

Total numbers of the training groups (it is 16) and of the technicians that have attended to the training (it is 186), are bigger than it was contracted.

2. TRAINING CENTERS

Basic training center is organized at the Faculty of Mechanical Engineering and Naval Architecture, in Laboratory for Thermal Machines, Zagreb. Structure of all centers is as follows:

Training Center Zagreb

at Fakultet strojarstva i brodogradnje
Ivana Lučića 5, 10 000 Zagreb
Center leader: Tonko Ćurko, Ph.D.

Training Center Osijek

at Elektrotehnički fakultet Osijek
Kneza Trpimira 2B, 31 000 Osijek
Center leader: Antun Pintarić, Ph.D.

Training Center Rijeka

at Tehnički fakultet Sveučilišta u Rijeci
Vukovarska 58, 51 000 Rijeka
Center leader: Branimir Pavković, Ph.D.

Training Center Split

at Fakultet elektrotehnike strojarstva i brodogradnje
R.Boškovića b.b., 21000 Split
Center leader: Davor Lučin, Mr.Sc.

3. WRITTEN MATERIALS

All technicians were supplied by materials that were prepared especially for the needs of the project. They were supplied by:

- *Handbook for service technician*, issue financed by Ministry of environmental protection and physical planning (Attachment 1. previous Final Report, 2001),
- *Seminar interactive script*, prepared and printed in Training center Zagreb. (Attachment 2. previous Final Report, 2001),

Seminar script is prepared for the interactive lecturing, i.e. content of the script is the actual plan and program of the training course. It is as follows:

- Presentation of RMP Croatia,
- Introduction of Ozone issues,
- International and local regulations,
- Basic principles of refrigeration,
- Refrigeration technology with new alternative refrigerants, retrofitting and drop-in refrigerants, lubricants,
- Redesign and reconstruction of the existing units with respect to change of refrigerant,
- Installation technologies, safe maintenance services, hand-on training,
- Recovery and recycling technologies, hand-on training on training rig with recovery and recycling machines,
- Exchange of the refrigerant in the existing unit, hand-on training,
- Reclaiming technology, theoretical issues,
- Discussion on certificates and developing of national code of good practice.

All materials are prepared in a manner to accommodate to previous knowledge of the service technicians from the professional schools, and to give general idea about the importance of the environment protection applying recent technology achievements. All materials are written in Croatian language.

4. TRAINING OF TECHNICIANS

4.1 Execution of training courses

Three-day training courses were organized in all four training centers. Courses have started first in Training center Zagreb, first group on 07. November 2002. Courses were organized on Thursday, Friday and Saturday. Thursday and Friday training has lasted 8 school hours (8x45min) and on Saturday 6 school hours. Program of the courses was the same as it is presented in item 3. of this report.

At the end of every course an examination-test was performed and if it was not successful, an additional training was organized so that all attendees have successfully completed the course.

Lectures itself were presented by means of transparencies. Attendees were also provided by a full content of transparencies in a form of an interactive seminar script and by a Handbook for service technician which was presented to UNIDO earlier during execution of the Main contract, first part.

Through all three days cold snacks and refreshment beverages were offered to attendees.

Total number of technicians that have attended to the courses in all four centers in Croatia is 186 persons. Full list of service-technicians containing

names, companies of employment and training centers, is contained in Attachment 1 of this report.

Program of the courses was as follows:

- International legislation and regulations
- Presentation of RMP Croatia
- Introduction of Ozone issues
- Local regulations
- Basic principles of refrigeration
- Refrigeration technology with new alternative refrigerants, drop-in refrigerants, lubricants, hand on training
- Installation technologies, safe maintenance services, hand-on training,
- Recovery and recycling technologies, hand-on training on training rig with recovery and recycling machines,
- Exchange of the refrigerant in the existing unit, hand-on training,
- Reclaiming technology, theoretical issues,
- Discussion on certificates and developing of national code of good practice.

4.2 Certificates

All technicians that have successfully completed the course were awarded by a *Certificate of training* (Attachment 4. previous Final Report, 2001). In Republic of Croatia it is recognized by a Ministry of Environmental Protection and Civil Planning and soon it will become a license for operation and servicing of the machinery containing ozone-depleting substances. Certificates are signed by a director of the institution in which Training centers were organized and by a leader of the Training center. Certificates were printed on the protected paper and are coded.

5. TOTAL FIGURES

In the table 1. total number of attendees and groups in all four centers are presented. Number of attendees in any group was 10 to 12.

Table 1. RMP Croatia - total figures

RMP Center	Number of Groups	Technicians
OSIJEK	3	32
RIJEKA	4	42
SPLIT	2	22
ZAGREB	7	90
TOTAL	16	186

6. CONCLUSION

CTT considers all obligations deriving from the Contract NO 2000/09 AMENDMENT A have been fulfilled and completed. CTT also considers that the purpose of the project as well as quality of performed services have met the contracted requirements.

No.	Name	RMP Center	Company
1.	Alen Žugčić	Zagreb	PROMAC d.o.o.
2.	Branko Kuburić	Zagreb	FRIGO-KOR d.o.o.
3.	David Stamenković	Zagreb	EL&TA
4.	Đuro Radaković	Zagreb	KONČAR-SERVIS I PRODAJA d.d.
5.	Emil Šekutor	Zagreb	EL&TA
6.	Hrvoje Šipušić	Zagreb	ELEKTROMETAL d.d.
7.	Ilija Kosanović	Zagreb	KONČAR-SERVIS I PRODAJA d.d.
8.	Ivan Bicak	Zagreb	KONČAR-SERVIS I PRODAJA d.d.
9.	Ivan Štagar	Zagreb	OPREMA-URĐAJI d.d.
10.	Mato Mrak	Zagreb	KONČAR-SERVIS I PRODAJA d.d.
11.	Ratko Modrić	Zagreb	SPECTRA MEDIA MUJKIĆ k.d.
12.	Stipe Kardum	Zagreb	KONČAR-SERVIS I PRODAJA d.d.
13.	Sven Valek	Zagreb	OPREMA-URĐAJI d.d.
14.	Vladimir Bosiljevac	Zagreb	ELEKTROCOMMERC
15.	Vladimir Milak	Zagreb	OPREMA-URĐAJI d.d.
16.	Vlado Jagarčec	Zagreb	KONČAR-SERVIS I PRODAJA d.d.
17.	Zoran Bračun	Zagreb	FRIGO-KOR d.o.o.
18.	Željko Goršić	Zagreb	KARLOVAČKA PIVOVARA d.d.
19.	Ante Brkić	Zagreb	AMICRA d.o.o.
20.	Dalibor Hegol	Zagreb	TEHNO MARK TRADE d.o.o.
21.	Darko Strahonija	Zagreb	KOLNOA d.o.o.
22.	Davor Kopčić	Zagreb	GORENJE SERVIS ZAGREB MEP d.o.o.
23.	Dinko Borovec	Zagreb	TRA-MONT d.o.o.
24.	Dragan Grbac	Zagreb	TRA-MONT d.o.o.
25.	Dražen Šeketa	Zagreb	TERMOSERVIS d.o.o.
26.	Gabrijel Bratković	Zagreb	KONČAR-SERVIS I PRODAJA d.d.
27.	Goran Gligić	Zagreb	TERMOSERVIS d.o.o.
28.	Ivan Tesar	Zagreb	KLIMA-LUČKO
29.	Ivica Štefanko	Zagreb	KOLNOA d.o.o.
30.	Marcel Malečić	Zagreb	KONČAR-SERVIS I PRODAJA d.d.
31.	Mario Dokoš	Zagreb	DOMMETAL d.o.o.
32.	Miroslav Martinjak	Zagreb	TRA-MONT d.o.o.
33.	Nenad Matijević	Zagreb	"TEHNO VEDAX" LIMKO d.o.o.
34.	Slavko Goršek	Zagreb	GORENJE SERVIS ZAGREB MEP d.o.o.
35.	Srećko Stipanec	Zagreb	GORENJE SERVIS K.M.
36.	Svetislav Stojkoski	Zagreb	TERMOSERVIS
37.	Velimir Rumiha	Zagreb	TEHNO MARK TRADE d.o.o.
38.	Zdenko Matković	Zagreb	KLIMA-LUČKO
39.	Željko Hecker	Zagreb	TERMOSERVIS d.o.o.
40.	Marijan Lovrić	Zagreb	F.T. d.o.o.
41.	Zoran Damnjanović	Zagreb	F.T.
42.	Marinko Breščanović	Zagreb	MARKO
43.	Zvonko Rumenjak	Zagreb	RUMENJAK PROJEKT
44.	Marjani Mihaljević	Zagreb	GORENJE SERVIS K.M.
45.	Albert Bašić	Zagreb	KOLNOA d.o.o.
46.	Robert Orsag	Zagreb	TERMO SERVIS d.o.o.
47.	Mladen Šiltić	Zagreb	TERMO SERVIS d.o.o.
48.	Marinko Šulentić	Zagreb	AUTOBUSNA RADIONICA ZAGREB d.o.o.
49.	Danijel Kerin	Zagreb	PROMAC d.o.o.
50.	Davor Novosel	Zagreb	BI-EL
51.	Karlo Koščak	Zagreb	BI-EL
52.	Miroslav Eršeg	Zagreb	BI-EL
53.	Denis Tesar	Zagreb	KLIMA LUČKO
54.	Siniša Kosanović	Zagreb	KLIMA LUČKO
55.	Miroslav Trumbetaš	Zagreb	SERVIS KUĆANSKIH APARATA
56.	Saša Šulina	Zagreb	SPECTRAMEDIA k.d.

57.	Toni Šulina	Zagreb	SPECTRAMEDIA k.d.
58.	Stjepan Lanščak	Zagreb	FRASSINOX d.o.o.
59.	Vladimir Vidović	Zagreb	OBRT VIDOVIĆ
60.	Zdravko Šoštar	Zagreb	ELCO
61.	Vladimir Zelenić	Zagreb	TRGOCENTAR d.d.
62.	Nikola Štignjedec	Zagreb	ELEKTROKEM d.o.o.
63.	Ivan Labaš	Zagreb	ELEKTROKEM d.o.o.
64.	Miško Šanteković	Zagreb	ELEKTROMETAL d.d.
65.	Franjo Fabijan	Zagreb	ELEKTROMETAL d.d.
66.	Robert Štefan	Zagreb	OBRT ŠTEFAN
67.	Dražen Posavec	Zagreb	SKAI
68.	Vladimir Vinski	Zagreb	KARLOVAČKA PIVOVARA d.d.
69.	Davor Kulbicki	Zagreb	FRASSINOX d.o.o.
70.	Goran Kupec	Zagreb	TRGOCENTAR d.d.
71.	Tomislav Koščak	Zagreb	BI-EL
72.	Davor Keliš	Zagreb	BI-EL
73.	Mladen Horvat	Zagreb	BI-EL
74.	Branko Jović	Zagreb	ŠRC ŠALATA
75.	Damir Klokočki	Zagreb	K.D. FRIGO
76.	Darko Bezjak	Zagreb	KARLOVAČKA PIVOVARA d.d.
77.	Mladen Škreb	Zagreb	KOLNOA d.o.o.
78.	Lorenc Ligorio	Zagreb	F.S. LORENZO
79.	Dubravko Posavec	Zagreb	P.S.K.A.
80.	Marko Breščanović	Zagreb	MARKO
81.	Dražen Lazić	Zagreb	GORENJE SERVIS ZAGREB MEP d.o.o.
82.	Krešimir Mramor	Zagreb	ZIMA
83.	Marijan Ajster	Zagreb	AJSTER
84.	Predrag Teur	Zagreb	AJSTER
85.	Hrvoje Gregl	Zagreb	SPECTRA MEDIA MUJKIĆ
86.	Marijan Stančin	Zagreb	OBRT STANČIN
87.	Damir Herman	Zagreb	KLIMATERM
88.	Anton Kikaš	Zagreb	ELCO d.o.o.
89.	Josip Booz	Zagreb	PROMAC d.o.o.
90.	Branko Marteža	Zagreb	ELCO d.o.o.
91.	Saša Bakarčić	Rijeka	BIOMERX d.o.o.
92.	Miroslav Čup	Rijeka	FRIGODEN d.o.o.
93.	Marijan Dukić	Rijeka	FRIGODEN d.o.o.
94.	Damir Grubišić	Rijeka	FRIGOKOR
95.	Zlatan Jakupović	Rijeka	FRIGOKOR
96.	Aleksandar Jovanović	Rijeka	FRIGOKOR
97.	Arsen Karuza	Rijeka	
98.	Dalibor Kovačićek	Rijeka	
99.	Marko Macuka	Rijeka	FRIGOKOR
100.	Marko Malić	Rijeka	DSK
101.	Igor Matrljan	Rijeka	
102.	Dean Meden	Rijeka	FRIGODEN d.o.o.
103.	Zoran Njirjak	Rijeka	SIRC d.o.o.
104.	Davor Pende	Rijeka	FRIGOARBA
105.	Vicko Pogorelić	Rijeka	FRIGOLUX
106.	Damir Samaržija	Rijeka	FRIGOLINE
107.	Elvis Smoljan	Rijeka	
108.	Dražan Stančulović	Rijeka	FRANZ d.o.o.
109.	Ivan Vergilas	Rijeka	DSK
110.	Angelo Antonini	Rijeka	ARMONT '84 d.o.o.
111.	Ratko Barukčić	Rijeka	BM-EUROMONT
112.	Nazif Begović	Rijeka	ARMONT '84 d.o.o.
113.	Đenko Belić	Rijeka	DEO

114.	Eneo Blažina	Rijeka	BELLOR d.o.o.
115.	Miroslav Bruketa	Rijeka	DEO
116.	Damir Doričić	Rijeka	ERA
117.	Tomislav Hrelja	Rijeka	KERSTIN d.o.o.
118.	Marino Katnić	Rijeka	K.M. FRIGOTEHNIKA
119.	Aldo Kersulić	Rijeka	
120.	Branko Kovačević	Rijeka	TERMOMONTAŽA
121.	Denis Križanac	Rijeka	LEDEN SERVIS
122.	Dinko Kučić	Rijeka	ELEKTROMEHANIČARSKI SERVIS
123.	Gabrijel Matošević	Rijeka	ELEKTROMEHANIČARSKI SERVIS
124.	Andrej Ottaviani	Rijeka	DEO D.O.O.
125.	Robert Pucić	Rijeka	SERVIS ROPOI
126.	Roman Roguljić	Rijeka	PULSAR
127.	Marinko Ružić	Rijeka	DEO
128.	Marko Sertić	Rijeka	DEO
129.	Željko Skrbín	Rijeka	ELEKTROTEHNIKA
130.	Mladen Šurlina	Rijeka	ELEKTROMEHANIČARSKI SERVIS
131.	Damir Turković	Rijeka	BM-EUROMONT
132.	Silvano Valentinuzzi	Rijeka	KONČAR - SERVIS I PRODAJA
133.	Ivica Slavica	Split	TUDIĆ-ELEKTRO CENTAR-ŠIBENIK
134.	Duje Maričić	Split	TUDIĆ-ELEKTRO CENTAR-ŠIBENIK
135.	Marijo Škaro	Split	TUDIĆ-ELEKTRO CENTAR-ŠIBENIK
136.	Mario Matijević	Split	FRIGO - KOR
137.	Duje Roje	Split	FRIGO - KOR
138.	Davor Marasović	Split	INSTALING - SPLIT
139.	Marijan Glibić	Split	SOKO MARIJAN-SPLIT
140.	Ivan Gavranović	Split	KONČAR-SERVIS I PRODAJA D.D.
141.	Rajko Mudrinić	Split	KONČAR-SERVIS I PRODAJA D.D.
142.	Marinko Vlahović	Split	ELECTRONIC DUBROVNIK
143.	Marko Bralić	Split	FRIGO-KOR
144.	Joško Skočić	Split	FRIGO-KOR
145.	Željko Šiklić	Split	TEHMAC - ZADAR
146.	Mate Perin	Split	TEHMAC - ZADAR
147.	Emil Gregov	Split	TEHMAC - ZADAR
148.	Vinko Matijaš	Split	VIMA - SPLIT
149.	Viktor Zolota	Split	AM – FRIGO SPLIT
150.	Nenad Vukman	Split	VIND - SPLIT
151.	Daniel Vukman	Split	VIND - SPLIT
152.	Mile Jukić	Split	FRIGO – KOR ZADAR
153.	Vlado Bacalja	Split	FRIGO – KOR ZADAR
154.	Sergio Radica	Split	KOMIS - SPLIT
155.	Krunoslav Bračevac	Osijek	FRIGOTEHNIKA-KLIMATEHNIKA
156.	Igor Edl	Osijek	FRIGO-TEHNIK
157.	Tomislav Habuda	Osijek	ETS HABUDA
158.	Ivan Janković	Osijek	
159.	Željko Job	Osijek	ELGRA
160.	Gordan Jurković	Osijek	OBRT "RASHLADNA I KLIMA TEHNIKA JURKOVIĆ"
161.	Ivan Kavur	Osijek	SRAZ doo
162.	Srećko Lukić	Osijek	KYDOKUMIAI
163.	Dario Maltašić	Osijek	ADAM
164.	Željko Metikoš	Osijek	KONTAKT
165.	Đuro Rašeta	Osijek	ELPOS DOO
166.	Zdenko Ringl	Osijek	GORENJE SERVIS
167.	Vladimir Šiljeg	Osijek	TEHNO SERVIS
168.	Dario Škarić	Osijek	ETS HABUDA
169.	Zvonimir Skender	Osijek	SKENDER d.o.o.

170.	Zlatko Žiroš	Osijek	RADIJATOR
171.	Mario Akšamović	Osijek	"MARIO" SERVIS
172.	Mirko Božanović	Osijek	OBRT ZA POPRAVAK KUĆ. APA.
173.	Vojislav Čubrilo	Osijek	
174.	Kristijan Gerber	Osijek	RADIJATOR
175.	Vlado Grepo	Osijek	ELEKTROMEHANIKA
176.	Augustin Jelušić	Osijek	SERVIS "JELUŠIĆ"
177.	Dalibor Korman	Osijek	SERVIS "JELUŠIĆ"
178.	Tomislav Pavošević	Osijek	HT TKC Požega
179.	Ivica Pešut	Osijek	KONIKOM
180.	Krešimir Rodić	Osijek	ES EDO SATINOVIĆ
181.	Zoran Rudec	Osijek	SERVIS KUĆANSKIH APARATA
182.	Miroslav Štrasser	Osijek	BOGDAN SERVIS
183.	Tomo Trstenjak	Osijek	UPRAVA ZA INSPEKCIJSKE POSLOVE PODRUČNA JEDINICA
184.	Dubravka Vlahović	Osijek	UPRAVA ZA INSPEKCIJSKE POSLOVE PODRUČNA JEDINICA
185.	Željko Vranić	Osijek	ETS HABUDA
186.	Damir Žlender	Osijek	GORENJE SERVIS