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  SISTEMI	PLANT	PHASE OUT OF CFCs AT REFRIGERATORS AND FREEZER PLANT OF ZEROWATT ELECTRICAL APPLIANCES GROUP , NANCHANG CHINA
	CUSTOMER CONTRACT N. JOB N.	UNIDO FOR ZEROWATT UNIDO 97/189 & AMENDMENT A PROJECT MP/CPR/97/091 22987220053

**PHASE OUT OF CFCs AT
REFRIGERATORS AND FREEZER
PLANT OF
ZEROWATT ELECTRIC
APPLIANCES CO**

FINAL REPORT



D					
C					
B					
A	16/07/01	FIST ISSUE	M. BARALE		
Rev.	Dat	Description	Prepared	Controll.	Approv.

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1. INTRODUCTION

With the present document The Contractor wants to describe the works performed at the plant site for the conversion of Zerowatt Electric Appliances Co. to phase out the use of CFC11 in the production of Refrigerators and Freezers.

Here below it is briefly summarised the activities performed under the Contract step by step according to The terms of Reference

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2- VISIT TO THE PROJECT SITE, LAY OUT OF THE PLANT, SPECIFICATION OF THE SITE PREPARATION (STEPS 1, 2,3 OF THE TERMS OF REFERENCE)

After the award of the order, the Contractor visited the Counterpart in February 1998 in order to verify the conditions of the site and to identify the best engineering solutions for the conversion of the existing foaming lines.

During the visit, the Contractor discussed and checked with the Counterpart the following main subjects:



A - Technical details regarding the supply of the equipment; in particular The Contractor emphasised the Premix Units, the Polyol Modules, Safeties of the plant (as i.e.: gas sensors, exhaust system with fan groups), cyclopentane storage tank and relevant accessories .

B - The suitable site where the new equipment had to be installed and the required modification to the new layout.

Regarding the C5 storage tank, the Contractor inspected and defined the area where it had to be positioned.

After the visit the Contractor prepared the first progress report(February 1998) including the preliminary lay-out and the Basic requirements and specifications for the site Preparation.

The first progress report covered all the subjects listed during the discussion and gave to the Counterpart, as much as detailed as possible at that phase of the project, a list of all the works and materials to be provided by them.

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3 TECHNICAL SPECIFICATION AND ENGINEERING DESIGN FOR THE PLANT ERECTION- TRAINING ABROAD OF THE COUNTERPART (STEPS 4÷8 OF THE TERMS OF REFERENCE)



In May 1998 the Contractor provided the Final Technical Documentation for the Conversion of the plant.

The above mentioned documentation included the following kind of detailed drawings and specifications:

- civil works for the storage tank and foaming lines
- grounding of the equipment
- piping arrangements and support details
- piping sketches
- box buildings construction
- ventilation construction
- cable run lay-out
- gas sensor positioning
- electrical drawings
- safety requirements

All the documentation was discussed with the Counterpart and some modifications have been agreed during the next period.

A team of engineers attended the training at Contractor site in August 1998.

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4. FOLLOW UP OF APPLICATION FOR OPERATING PERMIT, ORDERING OF MATERIAL, DELIVERY OF EQUIPMENT, ERECTION COMMISSIONING START-UP OF THE PLANT , TUV INSPECTION (STEPS 9÷17 OF THE TERMS OF REFERENCE)

In June and November 1998 the equipment related to contract 97/189 were shipped.

The installation started in December 1998, after the customs clearance of the equipment.

The Contractor engineers followed the installation phase including the supervision of the job at Counterpart charge.

The Contractor actions basically concerned the following zone of the modified plant:



- Cyclopentane storage tanks area
- Wet areas
- Process fluid connection piping between wet and dry area
- Refrigerator and freezer foaming areas
- Safeties of the plants (ventilation system, fire fighting system et cetera)

The installation phase of the refrigerator line was completed in April 1999
 In March 1999 the refrigerator plant was inspected by TUV

After the installation of the refrigerator line , the Contractor performed the Commissioning and start-up phase of the modified plant in accordance with the contract.

The commissioning , trial production and test run phases mainly concerned the following operations:

- Pneumatic and Electric circuit check
- Grounding check
- Flushing of the tanks and the piping with nitrogen
- Pressure test
- Check of the operating sequences
- Operating test
- Service simulation test

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- Setting start-up parameters
- Foaming quality check
- Performance test

The training on the job activities has been carried out at the beginning of commissioning phase (May 1999)



In June 1999 the Counterpart decided to reposition the freezer line.

All the activities related to the new lay-out of the freezer line were defined in the Amendment A of the Contract (awarded by Contractor in October 1999)

The engineering part and equipment related to the Amendment A were shipped by the Contractor in November 1999

The installation phase started in March 2000, after the Customs clearance of the equipment and was completed in October 2000.

The Counterpart signed the final acceptance certificate in December 2000.

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5. SAFETY CERTIFICATION

In October 2000 TUV inspectors visited the freezer and refrigerators line.



In December the Contractor visited the plant site to complete the modification requested by TUV.

On July 2nd 2001 TUV issued the commission list related to the visit at the plant site of October 2000.(please refer to attachment B)

In July 2001 Cannon and Zerowatt solved the pending points written by TUV.



Herewith please find the letter of confirmation of Cannon Bono Sistemi and Zerowatt.(attachment C)

The Contractor is now waiting for the issuing of the certificate by TUV .

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6. ENCLOSURE

- A) ACCEPTANCE CERTIFICATE
- B) COMMISSION LIST
- C) CONFIRMATION LETTERS

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A

07916708533



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SISTEMI

DATE:

COMMISSIONING ACCEPTANCE OF UNIDO PROJECT N. MP/CPR/97/091
N. 97/189 & AMENDMENT A

SUPPLIER: CANNON

BY THIS DOCUMENT ZEROWATT ELECTRIC APPLIANCES CO. ACKNOWLEDGES
THAT CANNON HAS SATISFACTORILY COMPLETED THE COMMISSIONING OF THE
PROJECT



DATE

ZEROWATT
ELECTRIC APPLIANCES CO

CANNON

[Handwritten signature]
2000.12.21.

[Handwritten signature]
~~04th Nov 2000~~
21st Dec 2000 *[Handwritten signature]*

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B

Commission List 2a

Safety Inspection of the Refrigerator and Freezer Plant of the CFC-conversion Project Zerowatt -

Bau und Betrieb

Plant-Supplier: Cannon Company
Bono Sistemi

Plant Location: Zerowatt E.A. Group
Nan'Chang
P.R. China

Project: Conversion of the Freezer and Refrigerator
Plants with Pentane as blowing agent

Plants: C-5 Storage plant
Mixing rooms
Refrigerator Plant
Freezer Plant
Safety Equipment

TÜV-Experts: Dipl.-Ing. K.J. Richardt - TÜV BB-Ulm
Dipl.-Ing (FH) E. Mack - TÜV BB-Ulm

Company group TÜV Süddeutschland

TÜV-Order No: 200 377 996

UNIDO Contract 97/189

Data:

- 15th/16th March 1999
- Monitoring of the plants at China
- July 1999
- Finishing of the Commission List
- 28th October till 2nd November 2000
- Final inspection in Zerowatt
- May/June 2001
- Finishing of Commission List 2

Participants: Responsible Persons of Cannon-Bono/Italy
Responsible Persons of Cannon Asia
Responsible Persons of ZeroWatt

Commssion List is Cannon-Bono/Italy - Mrs. Barale

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Ulm, 2001-07-02
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Bon-Zer-PRC-07-01comlist2a

The document included:
9 Pages

TÜV Süddeutschland
Bau und Betrieb GmbH
Aufsichtsratsvorsitzender:
Karsten Puell
Geschäftsführer:
Roland Ayx (Sprecher)
Dr. Kurt Vinzens
Sitz: München
Amtsgericht München
HRB 96 869

File: Bon/Zer-PRC/03/01



sent to:

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1 Preliminary Remark

At the Zerowatt company the plants for the production of freezers and refrigerators has been converted from CFC to pentane as blowing agent.

The TÜV Süddeutschland, branch Ulm, has got an order by Bono to make the safety inspection on this plants.

1.1 Procedure of safety inspection

The procedure of this safety inspection till now has been as follows:

a) Preinspection:

During the plant conversion the TÜV-experts carried out a pre-inspection in Zerowatt company.

- Dates of this preinspection: 15th/16th March 1999
- Result of this preinspection is listed up in: Commission List of the monitoring of the technical situation of the CFC-conversion, File No. Bon/Zer1-PRC/01/99

b) Safety inspection

After the finalization of the plant conversion the TÜV-experts have made the safety inspection.

- Dates of this inspection: 28th October - 2nd November 2000
- Result of this safety inspection was respectively in handles as following:
 - During the inspection the TÜV experts inspected deficiencies at the relevant plants. The technicians of Cannon/Bono and of Zerowatt started directly with the repairs and corrections of these deficiencies.
 - After this safety inspection the TÜV experts have made a re-inspection for an evaluation about the status of handling the deficiencies.
The solved deficiencies were cancelled in the internal list of the experts.



- In the time between the safety inspection and now the TÜV Süddeutschland has got several confirmations and documentation about the handling of open points from the parties involved.

1.2 Contents of the submitted commission list

The submitted commission list 2 contains following subjects:

- The evaluation of the TÜV experts about the status of handling the points on the bases of the commission list of the pre-inspection
- The pending points after the re-inspection and by attention the submitted confirmations.

1.3 Finalization of the safety inspection

The handling of the pending points listed up in the submitted TÜV commission list 2 have to be confirmed by the responsible companies.

After this confirmation is submitted by TÜV Süddeutschland the final report will be made and the TÜV certificate will be issued.

2 Commission list of the pre-inspection (monitoring)

- Date of pre inspection: 15th/16th March 1999
- File: Bon/Zer1-PRC/01/99
- File: Bon/Zer-PRC/02/01

2.1 Status of the commission list after safety inspection

On the bases of the carried out safety inspection on 28th October - 2nd November 2000 the TÜV experts have indicated the solution of all points described in this commission list.

The regulation of the responsibility is normally not a part of the technical experts but we made the crosses in the list and it should be seen as an suggest but we do not know all the details of the contract.



3 Status regarding pending points after the TÜV safety inspection

	Responsibility	
	Bono	Zerowatt
<p>3.1 General</p> <p>a) Most of the indicated deficiencies were solved during the presence of the TÜV experts i.e. these points are not listed up here.</p> <p>b) In the time between the safety inspection and now the TÜV Süddeutschland has received following confirmation and documentation:</p> <ul style="list-style-type: none"> - Fax message No. 128, date 12/03/2001 from BONO SISTEMI - Documentation related the Hydraulic tests of pipes 		
<p>3.2 Pentane storage area</p>		
<p>3.2.1 Unloading area</p> <p>f) Tank pit/Remark</p> <p>A gas sensor or a leakage detector don't exist presently and aren't planned this solution is only acceptable if following conditions are observed:</p> <ul style="list-style-type: none"> - the pentane feeding pump runs only if a request for the foaming plants exists <p>g) The technical data sheet of the flexible c5-unloading hoses must be submitted.</p>	<p>x</p> <p>x</p>	
<p>3.2.2 Tank equipment / tank area</p> <p>The control pipe of the jacket must be in a way that the system can</p>		



		Responsibility	
		Bono	Zerowatt
be checked by releasing of glycol.			
3.2.3	Control panel		
	The electrical diagram has to be up-dated (e.g. barrier N 201 is missing; fuse of lighting is missing)	x	
3.3	Premix station		
3.3.1	Control panel for buffer tank		
	a) The safety barrier U 110 must be fixed.	x	
	b) One temporary wire connection (twisted and are of tape) must be changed.	x	
3.4	Refrigerator factory		
3.4.1	c5-safety panel		
	a) The electrical diagram must be up-dated.		
	b) The circuit breaker next F 72-device is mounted only temporarily. A final installation of a circuit breaker with an over current protection is necessary.	x	
	c) The fuse in the circuit of the over voltage protection device is missing.	x	
	d) Gas monitoring central: In the circuit of the 1 st level alarm a normal relay (i.e. no safety relay) is temporarily mounted. A change of this solution according to the electrical diagram must	x	



	Responsibility	
	Bono	Zerowatt
be done.		
3.4.2 Door plant		
a) Fixture No. 12: Cables for the connection of the electrical heating are damaged.		x
b) Power panel for fixture-heatings: The RCD-switch often realised. The reason for these trippings must eliminated.		x
3.5 Freezer factory		
3.5.1 c5-safety panel (cabinet and door plants):		
a) The fuse in the circuit of the over voltage protection device is missing.	x	
3.5.2 Dry part-cabinet plant:		
a) Power supply for conveyor belt:		
– The circuit breaker must be positioned in a box.		x
– The cable connections have to be improved.		x
3.5.3 Wet part-door plant:		
a) c5/polyol-tank: In case of activation of nitrogen-minimum contact on the N2 -pressure gouge the automatic valve in the outgoing pipe doesn't close.	x	
3.5.4 Dry part-door plant:		
a) Operator panel at the mixing head:		



	Responsibility	
	Bono	Zerowatt
<ul style="list-style-type: none"> - On the enclosure of the operator panel the grounding is missing. - The EEx-i wiring in the operator panel has to be separated from the other wiring. 		<p style="text-align: center;">x</p> <p style="text-align: center;">x</p>
3.6 General Points		
3.6.1 Battery lamps along the escape ways:		
In case of an interruption of the electricity supply the battery lamps don't function.		x
3.6.2 Leakage monitoring of the wet part pumps:		
In case of an activation of the leakage detector the pumps don't stop automatically.	x	
3.6.3 Technical ventilation for the plants		
Zerowatt is planing to switch off the ventilation on the PU-plants during non-production periods for reasons of energy economy.		x
In the safety point of view this is only possible if a stand by-status for the ventilation is secured.		
Stand by-status means in case of a 2 nd or 1 st level alarm the ventilation must start automatically.		
Therefore the main switches in the c5-safety panels are not allowed to switch off. A stand by-status of the ventilation plants can be realized if the auxiliary circuits of the power contacters are switched off and in case of 2 nd or 1 st level these circuits will be activated automatically.		



		Responsibility	
		Bono	Zerowatt
3.6.4	Markings/descriptions at the technical equipment		
	The markings and descriptions at the control panels and operator panels have to be translated into Chines language.		x

4 Conclusion

This commission list 2a contains only the pending points which could not be solved during the final inspection and for which the experts have no final confirmation that this point has been solved.

After we have received the explanation in which way the pending points according to this list has been solved, the final report together with the certificate will be issued.



Ulm, July 2, 2001

The experts

K.-J. Richardt

E. Mack



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C

FROM : NCZEROWATT

PHONE NO. : 0791 +3801894

Jul. 10 2001 03:45PM P1

S.S.B.



RICEVUTO
10 LUG. 2001
MB

URGENT

July 10, 2001

Nanchang,

TUV SUDDENTSCHLAND
NIEDERLASSUNG ULM
BENZSTRABE 17
D-89079 ULM
GERMANY
TO MR. RICHARDT

Subj: UNIDO CONTRACT 97/198 AND AMENDMENT A

Dear Sir,

With reference to the commission list N.2 referring to the "safety inspection of the Refrigerator and Freezer of the CFC conversion" at our Factories Zerowatt E.A., with the present letter we inform you that we haven't changed the item 3.6.3 in commission list and all the other eight ones at our charge have been fulfilled.

Best regards.

Nanchang ZEROWATT

Vice Manager

Mr. Deng Xingyao.

南昌齐洛瓦电器集团
NANCHANG ZEROWATT ELEETRIC APPLIANCES GROUP

Cannon

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SISTEMI

Peschiera Borromeo, 12.07.2001

TUV SUDDEUTSCHLAND
NIEDERLASSUNG ULM
BENZSTRASSE 17
D-89079 ULM
GERMANY

ATT. MR RICHARDT

SAFETY INSPECTION OF UNIDO CONTRACT N. 97/198 & AMENDMENT A
(ZEROWATT -CHINA)

Dear Sir,

With reference to the Commission list n.2 about the safety inspection of the CFC conversion at the Refrigerator and Freezer plant (Project Zerowatt) we are writing to confirm you that the remarks written at Cannon Bono charge have been solved.

Best regards.

CANNON BONO SISTEMI

M. BARALE

