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<b>cannon</b> polyuretane technology	DOC N.	FR98/103
	Object	Phasing out of CFC's at IBERNA/EGYPT
	Contract	UNIDO N. 96/033

## FINAL REPORT

RETROFITTING OF THE REFRIGERATOR  
CABINET AND DOOR FOAMING PLANTS  
FOR THE REPLACEMENT OF CFC WITH  
CYCLOPENTANE AS BLOWING AGENT

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A	28/04/99	FIRST ISSUE	M. BARALE		
Rev.	Date	Description	Prepared	Control	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 the International Company for Refrigeration and Appliances -Iberna to phase out the use of CFC11 in the production of Domestic 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. LAY OUT OF THE PLANT /REDISIGN OF EXISTING (STEP 1 OF THE TERMS OF REFERENCE)

After the award of the order the Contractor visited the Counterpart between May 24<sup>th</sup> and 30<sup>th</sup> 1996 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 and Isocyanate Modules, Safeties of the plant (as i.e.: gas sensors, exhaust system with fan groups), cyclopentane storage tanks 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 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 REDISIGN OF EXISTING EQUIPMENT/ AWARD OF SUBCONTRACT FOR MODIFICATION OF THE PLANT(STEP 2,3 OF THE TERMS OF REFERENCE)**

In December 1996 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 building construction
- ventilation construction
- oven heating system 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.

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#### **4. DELIVERY OF EQUIPMENT/INSTALLATION ( STEP 4,5 OF THE TERMS OF REFERENCE)**

In May 1997 all the new equipment have been shipped.

The installation started in July 1997 , after the customs clearance of all the equipment.

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

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

- Cyclopentane storage tank area
- Wet area
- Process fluid connection piping between wet and dry area
- Cabinets /doors foaming area

A team of engineers attended the training at Contractor site ( abroad) in November 1997

The installation phase was completed in May 1998

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## **5. COMMISSIONING. TRIAL PRODUCTION OF THE FIRST MODELS, TEST RUN OF PRODUCTION(STEP 5,6,7)**

After the installation phase the Contractor performed the Commissioning phase of the modified plant in accordance with the contract.

On June 2nd 1998 the commissioning phase has been completed and the Counterpart signed the Commissioning Acceptance of the project.

The training on the job activities has been carried out during the commissioning phase

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

The training on the job activities has been carried out during the commissioning phase.

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**6. SAFETY CERTIFICATION (STEP 8 OF THE TERMS OF REFERENCE)**

The safety inspection has been performed in April and July 1998 by TUV ULM ;  
Enclosed please find the TUV final report and TUV safety certificate



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**7.STARTING MASS PRODUCTION AND POST CONTRACT MONITORING( STEP 10,11 OF THE TERMS OF REFERENCE)**

After the commissioning phase and during the next sixth month the Contractor visited the Counterpart to check and to monitor the performance of the plant