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for a sustainable future

OCCASION

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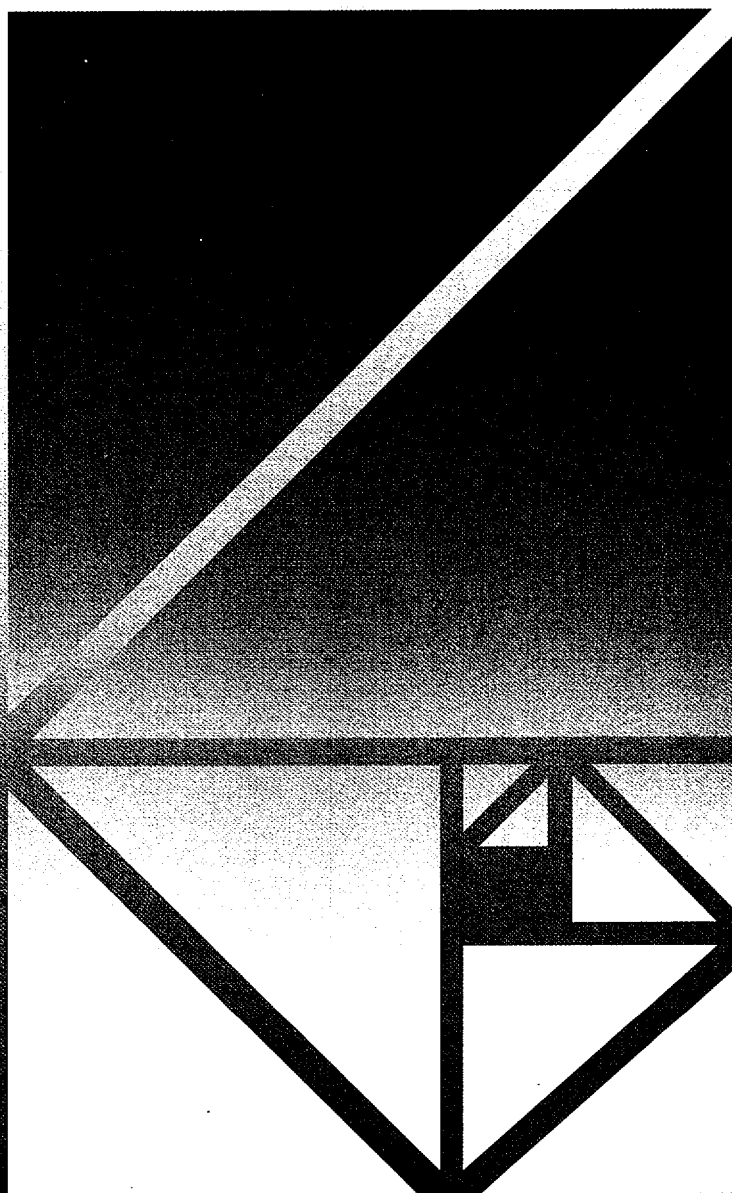
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22200

PERROS
INDUSTRIALE



**PROGRESS
THROUGH
ECOLOGY**

UNIDO PROJECT NUMBER MP/EGY/95/038

**PHASING-OUT ODS AT THE REFRIGERATOR PLANT OF
EL NASR (PHILIPS), ALEXANDRIA, EGYPT**

FINAL REPORT

Report covering all activities as per steps 10 through 11

of

Terms of Reference

including the safety statement of the equipment made by TUV Germany

INTRODUCTION

This final report include the following document:

- “CERTIFICATE OF ACCEPTANCE” signed up by the representative of EL NASR ELECTRIC & ELECTRONIC APPARATUS CO S.A.E. and Perros People after starting up the mass production of refrigerators made from 5th to 19th October 1998
- Here attached is also the safety statement of the equipment made by TUV Germany.

PERROS INDUSTRIALE S.p.A.



G. BOSSI
Project Engineer

CERTIFICATE OF FINAL ACCEPTANCE TEST

Customer : UNIDO
P.O. Box 300
A-1400 Wien
Austria

Consignee : EL NASR ELECTRIC & ELECTRONIC APPARATUS CO. S.A.E
New Commercial Market
El Mougawra 6th - 1st Industrial Zone
NEW BORG EL ARAB CITY
ALEXANDRIA - EGYPT

Supply : High pressure foaming machine and equipment for the use of Cyclopentane

Contract : UNIDO n° 96/034

Perros reference : L10

From ~~5-10-98~~ to ~~19-10-98~~ c/o EL NASR ELECTRIC & ELECTRONIC APPARATUS CO. S.A.E, our technicians Mr. Gianfrancesco and Mr Bianchi have finished the commissioning and have effected the final test of the following plants:

1. Ecodosing 2-50 DS-P
2. Cyclopentane storage
3. Polyol/Isocyanate storage
4. Safety systems

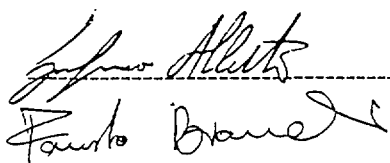
Starting from ~~15-10-98~~ the plants have successfully started to produce with the components and raw materials that were in the factory.

During the assembly and the final start-up of the plants, the necessary training for operators, maintenance people and safety team was done by Perros specialist.

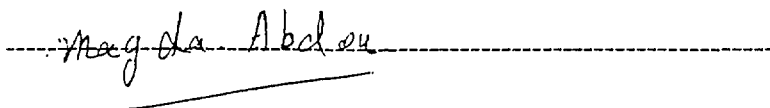
Perros confirms its availability for supporting EL NASR ELECTRIC & ELECTRONIC APPARATUS CO. S.A.E to solve the pending problems mentioned on the attached minutes of commissioning (see additional notes/remarks below).

PERROS INDUSTRIALE SPA

EL NASR ELECTRIC & ELECTRONIC APPARATUS CO



Fabio Brando



Magda Abdelou

Date: ~~19-10-98~~.....

Notes/remarks

see attached list

7
NEEASAE

0039 02 9420678



EL NASR ELECTRIC AND ELECTRONIC APPARATUS CO.

Pending items to be sent by Perros

- 1- Cyclopentain Filter in ecomix unit is leaking, a Brand new one will be sent by D.H.L to the hotel expected to arrive this week.
- 2- Electro-static paint is expired, a new one will be sent a.s.a.p
NEEASAE will be responsible for Painting & mixing instructions will be given to - day.
- 3- pressure regulator for polyol tank will be sent by D.H.L. to hotel. refer 1
- 4- 5 Automatic switch will be sent most probably next week by D.H.L. (4 - 6 Amp 1ph + 1 - 60 Amp 3ph + N).
- 5- Two relays will be sent soon. (sp. pents) . 2 relay 24 v / 2 Relay 110 v - and this base.
- 6- NEEASAE Can Send immediatly the old two injection heads, the third one NEEASAE Cannot Send be fore getting the new one (financial rules of the couuntry).
- Freight of first tow heads will be born by perros . the third one by NEEASAE . way of shipment must be indicatld by perros .
this is according to agreemet with Mr. Bossi

perros Experts

Yusef Alkhatib
Fant. B. ...

NEEASAE representative

18.10.92

[Signature]

Participants of Training Course on Cyclopentane Foaming System

Name

Signatur

Engeneering Dept.

1- Eng. Ahmed Moustafa EL. Kashlan .

A. Kashlan
17.10.98

2- Eng. Mourad Nagib Mouanes



3- Eng. Asharf Hafez Ousman



4- Eng. Ramadan Hamed Mahmoud



5- Ahmed EL. Said Matar



6- Ashraf Saleh EL. Said

Ashraf Saleh

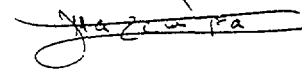
7- Sami Ramadan Seliman



8- Karam Mouhamed Abd EL. Hakim



9- Hazem Farouk Ebrahim

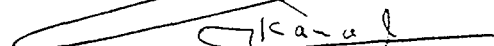


Production Dept.

1- Mahmoud Hossin Gaber

M.H.G

2- Kamal EL. Din Moustafa



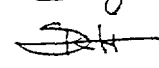
3- Abd EL. Alim Ebrahim Shaaban



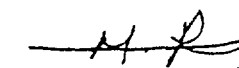
4- Eng. mouhamed Mahmoud Hassan



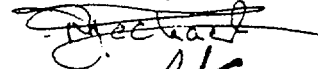
5- Eng. Kalid Abd EL. Hamid



6- Eng. Mouhamed Rashad



7- Eng. Mechael Ebrahim



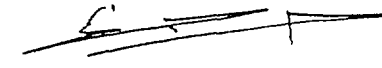
8- EL. Said Anoar Ebrahim

EL. Said Anoar

9- Khames EL. Zouhary



10- Mouhmed Mouhmed Maarouf

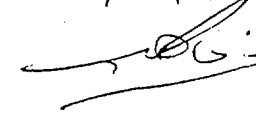


Quality Dept.

1- Eng. Mouhmed Hamed Hegazy

M. Hedy

2- Mouhmed Ahmed Mouhmed





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Unternehmensgruppe TÜV Süddeutschland

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Ihre Zeichen/Nachricht vom

Unsere Zeichen

Tel.-Durchwahl

Fax-Durchwahl

Datum

AW/ka

0731/4915-208

0731/4915-260

26. Oktober 1998

Richardt

KIAWRICHARDT98_DATENPERRCSIBF2_BRIANZONLDOC

Dear Mr. Brianzoni,

according to your request I enjoy to confirm following:

1. Background

TÜV-Süddeutschland
Branch Ulm
(following referred as TÜV)

has gained experience with safety engineering and certification for refrigerator and foam industries in many countries of the world. In conjunction with the progressive change-over to combustible blowing agents (Pentane, Pentane-Butane-blend) the experts of the Ulm branch of TÜV have used existing standards and developed together with experts of the PU field from engineering companies, plant producers, refrigerator producer and international organisation a safety strategy.

One part of the safety strategy is a safety evaluation of components of the PU plants and of all safety related parts of the plant.

All safety evaluations by the TÜV experts are based on International, European, German and particular national standards. The experience gathered with plant inspections and through evaluation of solutions based on measurements and the investigation of accidents since the start of plant conversion in 1992.

A special safety strategy was developed for fire and explosions hazards.

2. Safety evaluation

Safety evaluations by the TÜV experts basically cover the following tasks:

- Coordinate of the safety strategy with fire and explosion protection measures
- Review the feasibility of the proposed safety strategy
- Inspect existing buildings and technical facilities and components
- Functional testing of safety-related equipment at the plants
- Measurements at plant components under fire and explosion protection aspects
- Evaluate existing organisational procedures/requirements
- Review relevant parts of the documentation
- Define the state of the art of safety engineering by a comparison with plants used for similar purposes
- Per example following components of the safety system must be suitable, according to the rules and in good relation to each other:
 - Unloading station (plant specific) with filling pumps etc
 - Storage area (plant specific) with tank and equipment for different solutions
 - Grounding system
 - Wetpart (Components of Perros: Ecomix, Ecodosing, Ecokit), flexible pipes, Mixing head (often plant specific)
 - Drypart (Fixtures, Moulds, Heating system conveyer belts, needs always special solutions)
 - Building (fire proof walls, resistance of floor, Electrostatic, Lightning system, emergency exits, emergency light)
 - Safety panel (give signals and produce reactions together with parts of the equipment in case of failures in different levels)
 - Gas alarm system (depend often on the factory)
 - Ventilation system (depend on the particular situation)
 - Electrical data processing equipment (depend on particular situation)
 - Inertisation (depend on the design of fixtures and moulds)
 - Pentane emergency button (location depend on the particular situation)

- Back up Generator depend on the safety system at all (Ventilation, availability of Batteries for safety relevant systems)
- Marking of components
- Remote panel
- Documentation
- Measurements and protocols
- Safety related organisation

3. Exemplary documents used as a basis for plant evaluation

Technical regulations:

These plant evaluation is based on international, European and national regulations - in that order - as far as these are available and applicable.

These include the following essential regulations:

- permits and requirements of public authorities
- international standards (ISO, IEC)
- Ordinance Regulation Facilities for Storing, Racking and Transporting Combustible Liquids - Germany: VbF
- Decree over electrical components in explosion proof areas. (In Germany ExeV)
- Pressure Vessel Decree (Germany DruckbehV)
- Law about the environment (Germany Immissionsschutzgesetz: BImSchG)
- Law for protection against water-polution (Germany: Wasserhaushaltsgesetz WHG)
- Electrotechnic regulations: International: IEC / European: EN / National: DIN VDE e.g. IEC 60073, IEC 439-1/A2, IEC 204-1, IEC 1310-2, EN 50054, EN 50013, EN 50020, EN 50081, EN 60529, pr. EN 1050, DIN VDE 0165, EN 349, EN 418, EN 294
- Fundamental safety aspects to be considered for measurement and control equipment: Germany DIN-V 19250
- Safety requirements for automated manufacturing systems: Germany VDI 2854
- personal protection regulations : accidents prevention -European: EN..EC / Germany UVV, ZH
e.g. VBG 1, VBG 5, VBG 61, ZH 1/200, ZH 1/255, ZH 1/8; ZH 1/10

- Technical regulations for combustible liquids and for gases: Germany TRbF / TRG
e.g. TRbF 100, 110 / TRG 280
- Ex-proof / spark-proof for ventilators: Germany VDMA-24169 part 1
- Homologation of technical plant and equipment - European: conformity certificates (e.g. PTB , Cesi, Damko)
- EN 378, Refrigerating systems and heat pumps, safety and environmental requirements
- pr EN 1612-2 Reaction molding machines
- EG machine directive (89/392 / ESG, revised edition 91/368 / EEC)
- CEI / IEG 335-2-24, Safety of household and similar electrical appliances
- IEC 79-10/EN 60079-10 / VDE 0165 Part 101: Electrical apparatus for explosive gas atmospheres - classification of hazardous areas
- IEC 79-XX in general

4. Investigation of Perros components

TÜV has inspected in the past some refrigerator plants installed by Perros.

In the meantime the components like

- Storage tank
- Eco-mix
- Eco-kit
- Eco-Dosing

has been revised by Perros. The last revision of these components has been checked end of September 1998.

If Perros produce the above mentioned new components in the same way they will meet the TÜV requirements.

The safety of a PU plant at all can only be judged after all components are valuated and the construction and safety relevant functions between all parts is according to the rules and the particular safety strategy.



ANLAGEN UND UMWELT

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5. Conclusion

Each refrigerator factory which used Pentane as blowing agent needs a safety concept which includes the parts mentioned in chapter 2.

Some of the parts can be standardised but a lot of installations and regulations are very particular for each factory.

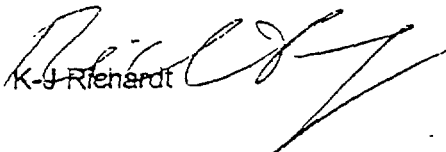
After we worked together with Perros we are able to state that the in chapter 4 mentioned parts of Perros can be included in a safety concept of a PU plant at all.

The parts like Ecockit, Ecodosing and Exomix in the last version met our safety requirements. The investigated Perros equipment together with a safe design, installation and organisation of the whole safety system are able to convert a refrigerator factory to a safe factory which can use Pentane as blowing agent.

TÜV Süddeutschland

Branch Ulm

The expert


K.-J. Richardt

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