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POLYURETHANE TECHNOLOGY DIVISION

**PHASING OUT OF THE USE OF ODS  
in the production of  
POLYURETHANE SANDWICH PANELS**

at

**MAMMUT INDUSTRIAL COMPLEX  
TEHRAN  
ISLAMIC REPUBLIC OF IRAN**

**COMMISSIONING / FINAL REPORT**

**UNIDO PROJECT No: MP/IRA/95/126**

**August 2002**

## Cannon Viking Project - TC 1634

### Phasing Out of ODS - at the Mammut Industrial Complex Factory Tehran, Islamic Republic of Iran

Project Number:	MP/IRA/95/126	Contract Number:	96/042
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#### 1. Introduction

Within this Final Report, the Contractor details the works carried out at the plant site of the Mammut Industrial Complex to phase out the use of ODS in the production of Polyurethane Insulated Sandwich Panels.

The following report briefly summarises the step-by-step activities performed under the Contract, in accordance with the Terms of Reference.

#### 2. Visit to the Project Site, Layout of the Plant and Specification of the Site Preparation (Steps 1.1 – 1.11 of the Terms of Reference)

Following the award of the order, the Contractor visited the Counterpart in March 1997 in order to verify the conditions of the site and to identify the best engineering solutions for the conversion of the existing 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 Pre-mix Units, the Polyol Modules, Safety of the Plant (i.e. gas sensors, exhaust system with fan groups), Cyclopentane Storage Tank and relevant accessories.
- B) The suitable site where the new equipment would be installed and the required modification to the new plant layout.

With regard to the Pentane Storage Tank, the Contractor inspected and defined the area where it would be positioned.

Following the visit, the Contractor prepared the First Progress Report (April 1997), including preliminary layout and the basic requirements and specifications for the site preparation.

2. **Visit to the Project Site, Layout of the Plant and Specification of the Site Preparation (Steps 1.1 – 1.11 of the Terms of Reference) (continued)**

The First Progress Report covered all the subjects listed during the discussion and provided the Counterpart with a list of all works and materials to be provided by them, with as much detailed information as possible at that phase of the project.

3. **Technical Specification and Engineering Design for the Plant Erection (Steps 1.12 – 3.9 of the Terms of Reference)**

In June 1997 , the Contractor provided the Counterpart with Final Technical Documentation for the conversion of the plant.

The above-mentioned documentation included the following type 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
- cable run layout
- gas sensor positioning
- electrical drawings
- safety requirements

All documentation was discussed with the Counterpart, with some modifications being agreed to be implemented during the next phase.

A team of engineers attended a training session at the Contractor's site in August/ September 2000 and June 2002.

4. **Delivery of Equipment and Erection/Commissioning Start-Up of the Plant  
(Steps 4 – 5.7 of the Terms of Reference)**

In November 1997 the equipment relative to Project MP/IRA/95/126 was shipped.

Installation commenced in June 2000, following Customs clearance of the equipment which, together with other factors that had caused delays to the Installation, had been concluded.

The Contractor's engineers completed the Installation phase, including supervision of the work, at cost for the Counterpart's account.

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

- Polyol, MDI, Activator and Pentane Metering Units
- wet areas
- process fluid connection piping between wet and dry areas
- laydown foaming area
- safety areas of the plant (ventilation system and gas sensors, etc.)

The Installation phase of the panel line was completed in June 2002.

Following completion of the Installation, the Contractor performed the Commissioning and Start-up Phase of the modified plant, in accordance with the terms of the Contract.

Commissioning, trial production and test run phases of the plant mainly concerned the following operations –

- Production of a panel size and thickness for a continuous number of hours
- Pneumatic and electric circuit check
- Grounding check
- Flushing of tanks and piping with Nitrogen
- Pressure testing
- Check of the operating sequences

4. Delivery of Equipment and Erection/Commissioning Start-Up of the Plant (Steps 4 – 5.7 of the Terms of Reference) (continued)

- Operating test
- Service simulation test
- Calibration of all metering streams
- Setting start-up parameters
- Foaming quality check
- Performance test

The training of the on-the-job activities was carried out at the beginning of the Commissioning phase (September 2000 and June 2002).

5. **Location Change**

In November 1997 – prior to the start of the Installation phase – the machine location was changed to a new factory site.

After a delay of two years', as a result of protracted negotiations with the Counterpart, the Installation phase finally commenced in June 2000. Completion of the Installation phase was in February 2001.

March 2001 saw the commencement of the Commissioning phase. Despite problems encountered during this period, completion and final acceptance of the equipment took place in June 2002.

Spare Parts to cover one additional year's operation were supplied in June 2002 during final machine training.

For and on behalf of :  
CANNON VIKING LIMITED



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