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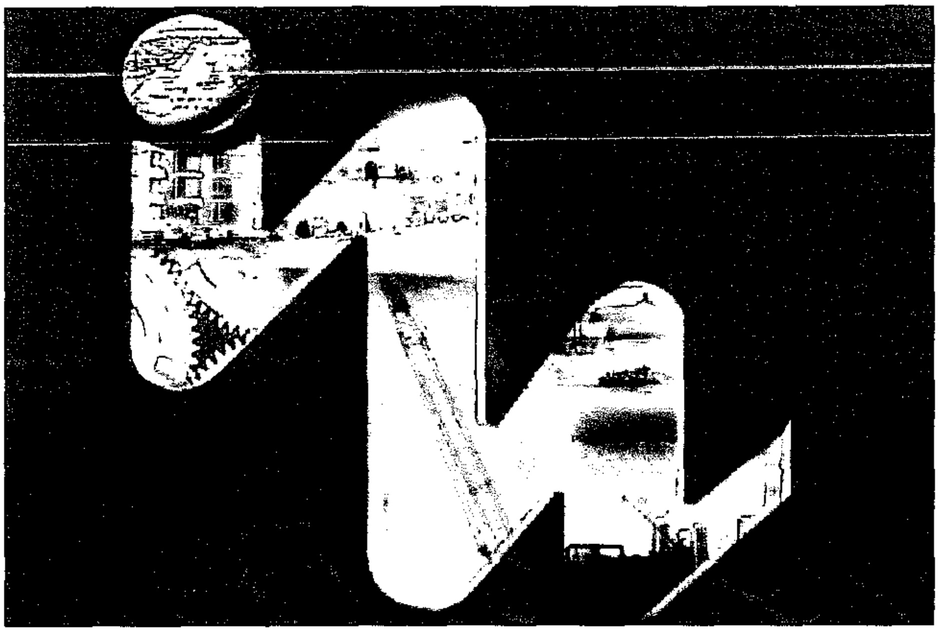

FINAL PROJECT PROGRESS REPORT

CONVERSION OF CARBON TETRACHLORIDE (CTC) AS PROCESS SOLVENT TO 1,2- DICHLOROETHANE AT ZAFA CHEMIE, LAHORE

October 6, 2008

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IN CONSULT FINAL PROGRESS REPORT

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IN CONSULT FINAL PROGRESS REPORT

CONVERSION OF CARBON TETRACHLORIDE (CTC) AS PROCESS SOLVENT TO 1, 2-DICHLOROETHANE AT ZAFA CHEMIE, LAHORE

1. The Project Objectives

The objective of this project is to phase out the use of 72.7 Metric Tons of carbon tetrachloride (CTC) in the solvent sector at ZAFA Chemie in Lahore. This constitutes approximately 14.2% of the CTC consumption in the country. CTC is used as process solvent in the manufacture of 4-isobutylacetophenon (IBAP), an Ibuprofen precursor. CTC will be replaced with 1,2-dichloroethane as a non-ODS process solvent.

2. Company Baseline Data

ZAFA Chemie (formerly Himont Chemicals Limited) is a 25 years old pharma enterprise with its own laboratory facilities. The company is manufacturing and marketing pharmaceutical active ingredients and various formulations under Good Manufacturing Practices (GMP) and has a well-established position in the Pakistani market. Plant's production site for Ibuprofen and Sulphamethoxazole is located in Raiwind, Lahore.

As per project document, company was occupying 165 employees and had in the fiscal year 2000 a turn over of US$ 3.85 millions. Himont started the Ibuprofen production in 1993 with an installed capacity of 230 MT/year (based on 10 month production) and its annual production during 1998-1999 was 103.7, in 1999-2000 was 54.2 and in 2000-2001 was 113.2 metric tons. The use of CTC during these years was 88, 42 and 88 metric tons respectively.

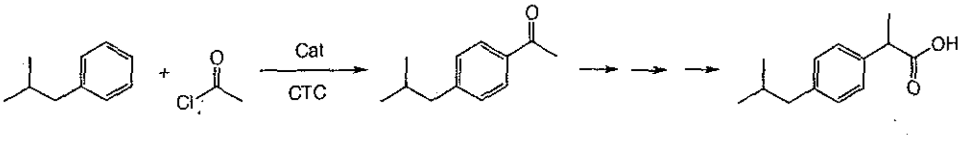
3. Present technology and production equipment

ZAFA Chemie (previously Himont Chemicals) is the largest Ibuprofen manufacturer in Pakistan. The company manufactures Ibuprofen batch-wise in following four-step sequence:

- Friedel-Crafts-Reaction of 4-isobutylbenzene (IBB) with acetylchloride (AC) to 4-isobutylacetophenon (IBAP)
- Reaction of 4-isobutylacetophenon and isopropyl chloro acetate to the corresponding glycidic ester
- Hydrolysis of the glycidic ester to 2-(4-isobutylphenyl)-propionaldehyde
- Oxidation of 2-(4-isobutylphenyl)-propionaldehyde to Ibuprofen

At Himont the reaction is carried out in carbon tetrachloride as process solvent. After decomposition of the product-aluminium-trichloride-complex with water, phase separation, washing, neutralization and drying of the organic layer; 4-isobutylacetophenon is finally obtained by distillation.

Chemical reaction for 4-isobutylacetophenon



isobutylbenzene 4-isobutylacetophenon Ibuprofen

The Friedel Crafts Reaction is the step determining the production velocity, which requires 12 hours per batch. The achievable yield lies at 98.4 % related to isobutyl benzene. Himont produces approx. 472.7 kg isobutyl acetophenon per batch and 950.4 Kg per day, which are sufficient for ~755.2 kg Ibuprofen.

4. Proposed New Technology Conversion of the Production process

Due to the adverse effects of CTC on environment and humans, its elimination or reducing its uses as process agent had to be realized in an environment friendly and cost effective way. As mitigation measure, process conversion, emission control and replacement technologies were examined for implementation. Keeping in view the economic and environmental benefits, the replacement of CTC by an ozone non-depleting solvent has been selected as the best option. 1,2-dichloroethane a viable and eco-efficient alternative has been identified and selected for this, which also facilitates the Friedel-Crafts-Reaction. Consequently, the present process will be modified. The following additional equipment was identified for completing the intended technology transfer:

- Nitrogen Generator including air compressor
- Chilling Plant
- Steam Boiler
- 3,000 liter glass lined reactor with stirrer (Friedel-Craft-Reactor)
- 5,000 liter glass lined reactor with stirrer (Quencher /Separator)
- 3,000 liter glass lined reactor with stirrer (Holder vessel)
- 3,000 liter glass lined reactor with stirrer (Neutralization, drying, solvent recovery)
- Tubular type condenser surface area of 12 M2 of SS-316
- Tubular type condenser surface area of 4 M2 of SS-316
- High vacuum pump of 5000 liter/minute displacement
- 1,000 liter stainless steel distillate receiver
- 3,000 liter stainless steel distillate receiver

5. Background of IN Consult Contract and its Amendment

IN Consult signed a contract with UNIDO # 2004/056 on March 29, 2004 for an agreed Terms of Reference and per working arrangements on the implementation procedures between UNIDO and Himont Chemicals, based on that a detailed design document was issued to UNIDO. Latter on the financial and management problems accrued at the company and the lengthy crises culminated in 2005 when the company has been overtaken by ZAFA Chemie. The new owners submitted their commitment to carryout the activities reflected in the approved project. The new owner also forwarded their request to UNIDO to take necessary arrangements for expedient completion of the project. Due to lack of technical capacity & experience of the new management of beneficiary company, it was felt necessary that the existing scope of work under which the contract was awarded to IN Consult should be amended and an amendment to the existing contract between UNIDO & IN Consult was executed on October 12, 2006. In compliance to the contract alongwith its amendment, IN Consult completed all the design related services and issued report to UNIDO on June 14, 2007. Though the International competitive bidding by the services department of UNIDO Headquarter, UNIDO signed a Contract No. 16001351 for Project No. MP/PAK/01/226 between the United Nations Development Organization (UNIDO) and M/s. Chemsales Pakistan (Pvt.) Ltd on September 20, 2007. The commencement date of the contract is September 20, 2007. The project is financed by the Multilateral Fund for the implementation of Montreal Protocol. Under this contract the contractor M/s. Chemsales Pakistan (Pvt.) Ltd was required to provide a complete package of engineering services, equipment installations, safety and maintenance instruction materials and training of selected personnel to convert the whole existing production facilities to the use of 1,2 – Dichloroethane as non-ODS at ZAFA Chemie Lahore to phase-out 80 ODP tons of Carbon Tetrachloride (CTC).

6. Consultants Progress Report

IN Consult being responsible for the construction supervision of this contract has submitted to UNIDO 2 progress reports. The 1st report was submitted on November 08, 2007 and the 2nd report in April 2008. This is the 3rd and last progress report covering the activities/ sub-activities completed.

This report summarizes the status of the contractors work and the progress made including, an updated work plan. The detailed status of works done against each activity/sub-activity is provided as Annex-1. The summary of the work schedule and detailed schedule for each activity is attached as Annex-2. The photographs showing work progress is attached as Annex-3.

CD of the plant movie showing work progress with regard to civil works, Installation, testing, commissioning of new equipments required for the conversion technology, associated piping works and old equipment dismantled shall be provided to project authorities during the forth coming visit of the delegation of M/s. Zafa Cheime and IN Consult to Vienna expected in the first weak of November 2008.

A certificate of the destruction of ODS based production equipment duly signed by the project owner and representative of Ozone Cell, Ministry of Environment is attached as Annex-4. The certificate is on the format as provided by the UNIDO Headquarter confirming that the redundant equipment has been disposed/ destroyed according to the project document and in accordance with the provisions as stipulated in the project document concerning the ODS based equipment.

The status of each activity/ sub activity is as under:

Activity-A:

Erection, Installation, testing and commissioning of Equipment already delivered at project site

The status of each of the sub-activity included under this activity is as follows:

Sub-activity A-1

The contractor's scope of work for this sub-activity included:

Nitrogen Generator including air compressor, supplied by M/s. Rich Air Separation Co. Ltd., China (catalog no. PSA-N2). The work includes transportation of equipment from beneficiary's warehouse located within the plant area, installation, testing and commissioning conforming to the supplier's instruction document available at plant site for consultation. The work shall be complete in all respect including all electromechanical works.

Present Status

The equipment was shifted from warehouse to the project site and was uncrated. No visual damage was observed. Various parts received through the shipment were assembled and the complete unit was installed on the foundation in a room covered under F-1 of contract related to civil works. The earth of the equipment was connected with the main earthing system of the plant. Testing and commission of the equipment has also been carried out and connected with the overall system. Refer annex 2A-1 for detailed schedule.

Sub-activity A-2

The contractor's scope of work for this sub-activity included:

Chilling Plant manufacturer type TK12, supplied by M/s. Thermal Engineering Systems (TES), UK. The work includes transportation of equipment from beneficiary's warehouse located within the plant area, installation, testing and commissioning conforming to the supplier's instruction document available at plant site for consultation. The work shall be complete in all respect including all electromechanical works.

Present Status

The equipment has been installed, tested, commissioned and connected with the system. This sub-projects stands completed. Refer annex 2A-2 for detailed schedule.

Sub-activity A-3

The contractor's scope of work for this sub-activity included:

Steam Boiler manufacturer model no. FH1600, supplied by M/s. Metal Industries Co. (METALCO), Jordan, including installation of Boiler, ladder and top steel platform for boiler, skid mounted duplex automatic water softener, chemical dosing pump with tank and all associated accessories. The work includes transportation of equipment from beneficiary's warehouse located within the plant area, installation, testing and commissioning conforming to the supplier's instruction document available at plant site for consultation. The work shall be complete in all respect including all electromechanical works.

Present Status

The equipment has been installed. The testing and commissioning was delayed due to non-availability of O&M manual. However, after getting approval from the Project Manager, the testing, commissioning and trial run work was awarded to M/s. Masud Khan and Associates. The sub-contractor has completed the work including testing and commissioning as advised by M/s. Chemsales through their letter of September 28, 2008. The copy of the letter is attached as Annex-5. Refer annex 2A-3 for detailed schedule.

Activity –B

Supply; erection, installation, testing and commissioning of imported equipment;

The contractor's scope of work for this sub-activity included:

Sub-activity B-1

3,000 liter glass lined reactor with stirrer (Friedel-Craft-Reactor). The supply shall be on DDU basis. The work shall be complete in all respect including all electromechanical works. The work includes supply, installation; testing and commissioning shall conform to the supplier's instruction document and shall conform to the specification attached as D-1.

Present Status

The shipping document was forwarded to Project Manager UNIDO Vienna through email of February 20, 2008. The equipment was delivered at the project site, uncrated and checked for any visual damages. Coordination and scheduling continued with M/s. Zafa Chemie as the installation requires plant shutdown. Following agreement with Zafa Chemie on the plant outage, the equipment has been installed, tested and commissioned. Refer annex- 2B-1 for the schedule.

Activity B-2

5,000 liter glass lined reactor with stirrer (quencher/ separator). The supply shall be on DDU basis. The work shall be complete in all respect including all electromechanical works. The work includes supply, installation; testing & commissioning shall conform to the supplier's instruction document and shall conform to the specification attached as D-2.

Present Status

The shipping document was forwarded to Project Manager UNIDO Vienna through email of February 20, 2008. The equipment was delivered at the project site, uncrated and checked for any visual damages. Coordination and scheduling continued with M/s. Zafa Chemie as the installation requires plant shutdown. Following agreement with Zafa Chemie on the plant outage, the equipment has been installed, tested and commissioned. Refer annex- 2B-2 for the schedule.

Sub-activity B-3

3,000 liter glass lined holder vessel with stirrer (holder vessel). The supply shall be on DDU basis. The work shall be complete in all respect including all electromechanical works. The work includes supply, installation; testing & commissioning shall conform to the supplier's instruction document and shall conform to the specification attached as D-3.

Present Status

The shipping document was forwarded to Project Manager UNIDO Vienna through email of February 20, 2008. The equipment was delivered at the project site, uncrated and checked for any visual damages. Coordination and scheduling continued with M/s. Zafa Chemie as the installation requires plant shutdown. Following agreement with Zafa Chemie on the plant outage, the equipment has been installed, tested and commissioned. Refer annex- 2B-3 for the schedule.

Sub-activity B-4

3,000 liter glass lined reactor with stirrer (neutralization, drying, solvent recovery). The work shall be complete in all respect including all electromechanical works. The work includes supply, installation; testing and commissioning shall conform to the supplier's instruction document and shall conform to the specification attached as D-4.

Present Status:

The equipment was purchased separately as per instruction of Zafa Chieme and was installed at the plant site during end last year. The equipment was commissioned and put on trial run. The equipment is currently operating as a part of the overall process. Refer Zafa Chieme letter of December 10, 2007 addressed to UNIDO Headquarters Vienna. The copy of the letter is attached as Annex-6. Refer annex- 2B-4 for the schedule.

Sub-activity B-5

Tubular type condenser surface area of 12 M^2 of stainless steel 316. The work shall include supply, installation, testing and commissioning shall conform to the supplier instruction document and shall be complete in all respect including all electromechanical works and shall conform to the specification attached as D-7

Present Status

The shipping document was forwarded to Project Manager UNIDO Vienna through email of February 20, 2008. The equipment was delivered at the project site, uncrated and checked for any visual damages. Coordination and scheduling continued with M/s. Zafa Chemie as the installation requires plant shutdown. Following agreement with Zafa Chemie on the plant outage, the equipment has been installed, tested and commissioned. Refer annex- 2B-5 for the schedule.

Sub-activity B-6

Tubular type condenser surface area of 4 M^2 of stainless steel 316. The work shall include supply, installation, testing and commissioning shall conform to the supplier instruction document and shall be complete in all respect including all electromechanical works shall conform to the specification attached as D-8

Present Status

The shipping document was forwarded to Project Manager UNIDO Vienna through email of February 20, 2008. The equipment was delivered at the project site, uncrated and checked for any visual damages. Coordination and scheduling continued with M/s. Zafa Chemie as the installation requires plant shutdown. Following agreement with Zafa Chemie on the plant outage, the equipment has been installed, tested and commissioned. Refer annex- 2B-6 for the schedule.

Sub-activity B-7

High vacuum pump of 5000 liter/minute displacement. The inlet and outlet size of the pump shall be 1.5 inches. The work shall include supply, installation; testing and commissioning shall conform to the supplier instruction document and shall be complete in all respect including all electromechanical works.

Present Status

The shipping document was forwarded to Project Manager UNIDO Vienna through email of February 20, 2008. The equipment was delivered at the project site, uncrated and checked for any visual damages. Coordination and scheduling continued with M/s. Zafa Chemie as the installation requires plant shutdown. Following agreement with Zafa Chemie on the plant outage, the equipment has been installed, tested and commissioned. Refer annex- 2B-7 for the schedule.

Activity –C

Supply, erection, installation, testing and commissioning of locally purchased equipment

Contractor has examined the local market for procure these two equipments locally unfortunately these equipments are not readily available from the local representatives. Therefore, these equipments have also been procured from abroad.

The contractor's scope of work for this sub-activity included:

Sub-Activity C-1

1,000 liter stainless steel distillate receiver (for collection of water/DCE and DCE fractions). The supply shall conform to the specification attached as D-5. The work shall include supply, installation; testing and commissioning shall conform to the supplier instruction document and shall be complete in all respect including all electromechanical works.

Present Status

The shipping document was forwarded to Project Manager UNIDO Vienna through email of February 20, 2008. The equipment was delivered at the project site, uncrated and checked for any visual damages. Coordination and scheduling continued with M/s. Zafa Chemie as the installation requires plant shutdown. Following agreement with Zafa Chemie on the plant outage, the equipment has been installed, tested and commissioned. Refer annex- 2C-1 for the schedule.

Sub-Activity C-2

3,000 litre stainless steel distillate receiver (collection of water/DCE and DCE fractions). The supply shall conform to the specification attached as D-6. The work shall include supply, installation; testing and commissioning shall conform to the supplier instruction document and shall be complete in all respect including all electromechanical works.

Present Status

The shipping document was forwarded to Project Manager UNIDO Vienna through email of February 20, 2008. The equipment was delivered at the project site, uncrated and checked for any visual damages. Coordination and scheduling continued with M/s. Zafa Chemie as the installation requires plant shutdown. Following agreement with Zafa

Chemie on the plant outage, the equipment has been installed, tested and commissioned. Refer annex- 2C-2 for the schedule.

Activity-D

Dismantling of existing equipment, this shall include Safe removal, transportation *and return to client's warehouse located in the plant area for the following:*

The contractor's scope of work for this sub-activity included:

Sub-activityD-1

Dismantling of 3,000 liter reactor with stirrer

Present Status

This sub-activity has been completed and the equipment after dismantling has been handed over to M/s. Zafa Chemie for its destruction. Refer Annex 2D.

Sub-activity D-2

Dismantling of 5,000 liter reactor with stirrer (quencher/ separator)

Present Status

This sub-activity has been completed and the equipment after dismantling has been handed over to M/s. Zafa Chemie for its destruction. Refer Annex 2D.

Sub-activity D-3

Dismantling of 3,000 liter holder vessel (holder vessel)

Present Status

This sub-activity has been completed and the equipment after dismantling has been handed over to M/s. Zafa Chemie for its destruction. Refer Annex 2D.

Sub-activity D-4

Dismantling of 3,000 liter reactor with stirrer (neutralization, drying, solvent recovery)

Present Status

This sub-activity has been completed and the equipment after dismantling has been handed over to M/s. Zafa Chemie for its destruction. Refer Annex 2D.

Sub-activity D-5

Dismantling of 1,000 liter stainless steel distillate receiver

Present Status

This sub-activity has been completed and the equipment after dismantling has been handed over to M/s. Zafa Chemie for its destruction. Refer Annex 2D.

Sub-activity D-6

Dismantling of 3,000 liter stainless steel distillate receiver

Present Status

This sub-activity has been completed and the equipment after dismantling has been handed over to M/s. Zafa Chemie for its destruction. Refer Annex 2D.

Sub-activity D-7

Dismantling of Condenser surface area of 12 M^2

Present Status

This sub-activity has been completed and the equipment after dismantling has been handed over to M/s. Zafa Chemie for its destruction. Refer Annex 2D.

Sub-activity D-8

Dismantling of Condenser surface area of 4 M^2

Present Status

This sub-activity has been completed and the equipment after dismantling has been handed over to M/s. Zafa Chemie for its destruction. Refer Annex 2D.

Sub-activity D-9

Dismantling of High vacuum pump of 5000 liter/ minute displacement

Present Status

This sub-activity has been completed and the equipment after dismantling has been handed over to M/s. Zafa Chemie for its destruction. Refer Annex 2D.

Activity-E

Piping works including supply, erection, installation, testing and commissioning of

The contractor's scope of work for this sub-activity included:

Sub-activity E-1

Pipeline from Nitrogen Generator to apparatuses; the piping shall be stainless steel of 1.5 inch diameter. Pipe length is approximately 200 meter. The work shall be complete in all respect including all kind of accessories, appropriate insulation, fittings and valves

Present Status

The pipe line from Nitrogen Generator to apparatuses (reactors) has been installed, tested and commissioned. Refer Annex-2E-1 for the schedule.

Sub-activity E-2

Pipeline from Chilling Plant to apparatuses. The piping shall be stainless steel of 3.0 inch diameter. Pipe length is approximately 150 meter. The work shall be complete in all respect including all kind of accessories, appropriate insulation, fittings and valves

Present Status

The activity stands completed. Refer annex-2E-2.

Sub-activity E-3

Pipeline from Vacuum Pump to apparatuses, the piping shall be stainless steel of 1.5 inch diameter. Pipe length is approximately 20 meter. The work shall be complete in all respect including all kind of accessories, fittings and valves

Present Status

The pipe line from Vacuum Pump to apparatuses (reactors) has been installed, tested and commissioned. Refer Annex-2E-3 for the schedule.

Sub-activity E-4

Pipe line from steam boiler from steam boiler to apparatuses the piping shall be stainless steel of 1.5 inch diameter pipe length is approximately 120 meter. The work shall be complete in all respect including all kind of accessories, fitting & valves.

Present Status

The pipe line from Steam Boiler to apparatuses (reactors) has been installed, tested and commissioned. Refer Annex 2E-4 for the schedule.

Activity-F

Civil works associated with the erection, installation, testing and commissioning of following

The contractor's scope of work for this sub-activity included:

Sub-activity F-1

Nitrogen Generator including air compressor manufacturer catalog no. PSA-N2, supplied by M/s. Rich Air Separation Co. Ltd., China. The civil work shall include construction of room. The activities shall include clearing of site, arranging accessibility, leveling and site preparation, associated brick and concrete works, anchoring of equipment, surface finishing etc. required for the installation of equipment according to the supplier's instructions.

Present Status

The activity stands completed. Refer annex 2F-1.

Sub-activity F-2

Chilling Plant manufacturer type TK12, supplied by M/s. Thermal Engineering Systems (TES), UK. The civil work shall include construction of room. The activities shall include clearing of site, arranging accessibility, leveling and site preparation, associated brick and concrete works, anchoring of equipment, surface finishing etc. required for the installation of equipment according to the supplier's instructions.

Present Status

The activity stands completed. Refer annex 2F-2.

Sub-activity F-3

Steam Boiler manufacturer model no. FH1600, supplied by M/s. Metal Industries Co. (METALCO), Jordan including Boiler, Ladder and top steel platform for boiler, Skid mounted duplex automatic water softener, Chemical dosing pump with tank and all associated accessories

Present Status

The activity stands completed. Refer annex 2F-3.

ANNEX-1

DETAILED STATUS OF WORKS DONE AGAINST EACH ACTIVITY/SUB-ACTIVITY

Project No. MP/PAK/01/226- UNIDO Contract No. 16001351

Coversion of Carbon Tetrachloride (CTC) as Process Solvent to 1,2- Dichloroethane at Zafa Chemie

Project Status as of September 30, 2008

Sr. #	Activity/ Sub-activity	Status
A	**Erection, Installation, testing and commissioning of Equipment already delivered at project site**	
1	Nitrogen Generator including air compressor	Installed, tested & commissioned.
2	Chilling Plant	Installed, tested & commissioned.
3	Steam Boiler	Installed, tested & commissioned.
B	**Supply, erection, installation, testing and commissioning of imported equipment;**	
1	3,000 litre glass lined reactor with stirrer (Friedel-Craft-Reactor).	Installed, tested & commissioned.
2	5,000 litre glass lined reactor with stirrer (quencher/ separator).	Installed, tested & commissioned.
3	3,000 litre glass lined holder vessel with stirrer (holder vessel).	Installed, tested & commissioned.
4	3,000 litre glass lined reactor with stirrer (neutralisation, drying, solvent recovery).	Installed, tested & commissioned.
5	Tubler type condenser surface area of 8 M2 of stainless steel 316.	Installed, tested & commissioned.
6	Tubler type condenser surface area of 4 M2 of stainless steel 316.	Installed, tested & commissioned.
7	Vacuum pump	Installed, tested & commissioned.
C	**Supply, erection, installation, testing and commissioning of locally purchased equipment**	
1	1,000 litre stainless steel distillate receiver (for collection of water/DCE & DCE fractions).	Installed, tested & commissioned.
2	3,000 litre stainless steel distillate receiver (collection of water/DCE & DCE fractions).	Installed, tested & commissioned.
D	**Dismanteling of existing equipment.**	
1	3,000 litre reactor with stirrer.	Dismantled and rendered un-usable.
2	5,000 litre reactor with stirrer (quencher/ separator).	Dismantled and rendered un-usable.
3	3,000 litre holder vessel (holder vessel).	Dismantled and rendered un-usable.

Project No. MP/PAK/01/226- UNIDO Contract No. 16001351

Coversion of Carbon Tetrachloride (CTC) as Process Solvent to **1,2- Dichloroethane at Zafa Chemie**

Project Status as of September 30, 2008

Sr. #	Activity/ Sub-activity	Status
4	3,000 litre reactor with stirrer (*neutralisation, drying, solvent* recovery).	Dismantled and rendered un-usable.
5	1,000 litre stainless steel distillate receiver	Dismantled and rendered un-usable.
6	3,000 litre stainless steel distillate receiver	Dismantled and rendered un-usable.
7	Condenser surface area of 8 M^2	Dismantled and rendered un-usable.
8	Condenser surface area of 4 M^2	Dismantled and rendered un-usable.
9	Vacuum pump type water ring	Dismantled and rendered un-usable.
E	**Piping works including supplly, erection, installation, testing and commissioning of**	
1	Pipeline from Nitrogen Generator to apparatusses.	Piping work completed, tested and commissioned
2	Pipeline from Chilling Plant to apparatusses.	Piping work completed, tested and commissioned
3	Pipeline from Vacuum Pump to apparatusses.	Piping work completed, tested and commissioned
4	Pipeline from Steam boiler to apparatusses.	Piping work completed, tested and commissioned
F	**Civil works associated with the erection, installation, testing and commissioning of following**	
1	Nitrogen Generator including air compressor	Completed
2	Chilling Plant	Completed
3	Steam Boiler	Completed

Project Commencement date: September 20, 2007

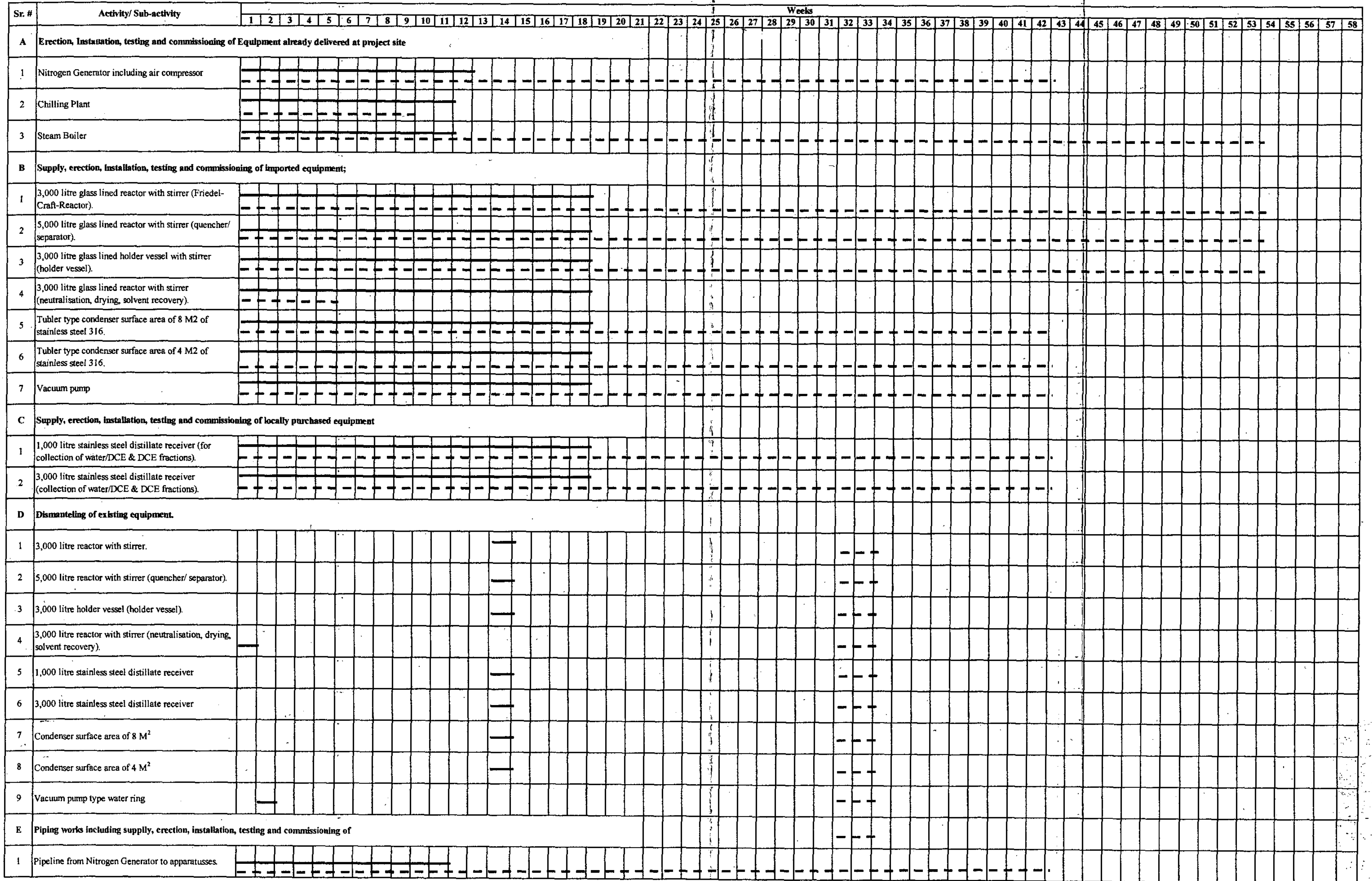
ANNEX-2

SUMMARY OF WORK SCHEDULE AND DETAIL SCHEDULE OF EACH ACTIVITY

Project No. MP/PAK/01/226- UNIDO Contract No. 16001351

Coversion of Carbon Tetrachloride (CTC) as *Process Solvent to* 1,2- Dichloroethane at Zafa Chemie

Summary

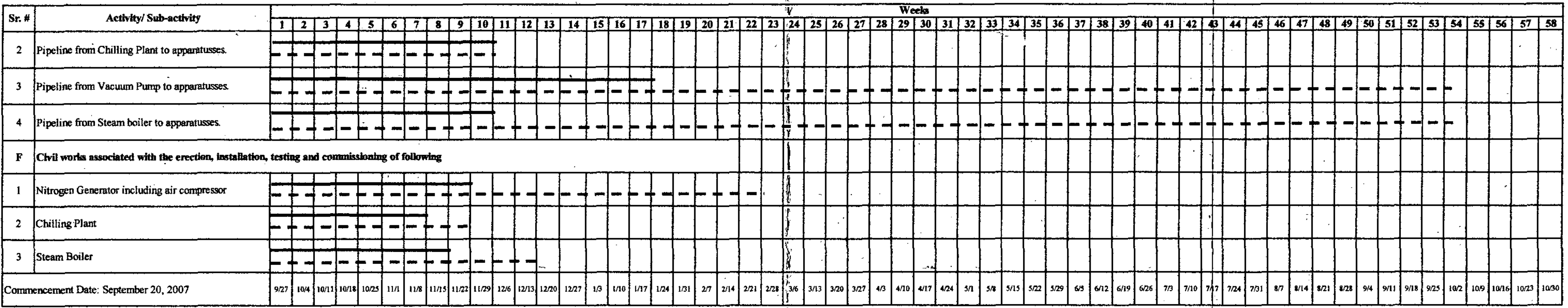


Sr. #	Activity/ Sub-activity
A	**Erection, Installation, testing and commissioning of Equipment already delivered at project site**
1	Nitrogen Generator including air compressor
2	Chilling Plant
3	Steam Boiler
B	**Supply, erection, installation, testing and commissioning of imported equipment;**
1	3,000 litre glass lined reactor with stirrer (Friedel-Craft-Reactor).
2	5,000 litre glass lined reactor with stirrer (quencher/ separator).
3	3,000 litre glass lined holder vessel with stirrer (holder vessel).
4	3,000 litre glass lined reactor with stirrer (neutralisation, drying, solvent recovery).
5	Tubler type condenser surface area of 8 M2 of stainless steel 316.
6	Tubler type condenser surface area of 4 M2 of stainless steel 316.
7	Vacuum pump
C	**Supply, erection, installation, testing and commissioning of locally purchased equipment**
1	1,000 litre stainless steel distillate receiver (for collection of water/DCE & DCE fractions).
2	3,000 litre stainless steel distillate receiver (collection of water/DCE & DCE fractions).
D	**Dismanteling of existing equipment.**
1	3,000 litre reactor with stirrer.
2	5,000 litre reactor with stirrer (quencher/ separator).
3	3,000 litre holder vessel (holder vessel).
4	3,000 litre reactor with stirrer (neutralisation, drying, solvent recovery).
5	1,000 litre stainless steel distillate receiver
6	3,000 litre stainless steel distillate receiver
7	Condenser surface area of 8 M^2
8	Condenser surface area of 4 M^2
9	Vacuum pump type water ring
E	**Piping works including supply, erection, installation, testing and commissioning of**
1	Pipeline from Nitrogen Generator to apparatusses.

Project No. MP/PAK/01/226- UNIDO Contract No. 16001351

Coversion of Carbon Tetrachloride (CTC) as Process Solvent to 1,2- Dichloroethane at Zafa Chemie

Summary



Sr. #	Activity/ Sub-activity	Weeks																																																									
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58
2	Pipeline from Chilling Plant to apparatusses.																																																										
3	Pipeline from Vacuum Pump to apparatusses.																																																										
4	Pipeline from Steam boiler to apparatusses.																																																										
F	**Civil works associated with the erection, installation, testing and commissioning of following**																																																										
1	Nitrogen Generator including air compressor																																																										
2	Chilling Plant																																																										
3	Steam Boiler																																																										
Commencement Date: September 20, 2007		9/27	10/4	10/11	10/18	10/25	11/1	11/8	11/15	11/22	11/29	12/6	12/13	12/20	12/27	1/3	1/10	1/17	1/24	1/31	2/7	2/14	2/21	2/28	3/6	3/13	3/20	3/27	4/3	4/10	4/17	4/24	5/1	5/8	5/15	5/22	5/29	6/5	6/12	6/19	6/26	7/3	7/10	7/17	7/24	7/31	8/7	8/14	8/21	8/28	9/4	9/11	9/18	9/25	10/2	10/9	10/16	10/23	10/30

As per Contract	━━
As per Actual	......

Annex-2A-1

Project No. MP/PAK/01/226- UNIDO Contract No. 16001351

Coversion of Carbon Tetrachloride (CTC) as Process Solvent to 1,2- Dichloroethane at Zafa Chemie

Work Schedule for Erection, Installation, testing and commissioning of Nitrogen Generator including air compressor

Sr. #	Activity/ Sub-activity	Weeks																																																					
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
1	Shifting of equipment to job site									—																			……																										
2	Uncrating & physical inspection									—																			……																										
3	Installation of equipment at foundation										—																			……																									
4	Connection with the pipeline											—																			……																								
5	*Testing & Commissioning*											—																				……																							
6	Trial Run												—																													……	……												
Commencement Date: September 20, 2007		9/27	10/4	10/11	10/18	10/25	11/1	11/8	11/15	11/22	11/29	12/6	12/13	12/20	12/27	1/3	1/10	1/17	1/24	1/31	2/7	2/14	2/21	2/28	3/6	3/13	3/20	3/27	4/3	4/10	4/17	4/24	5/1	5/8	5/15	5/22	5/29	6/5	6/12	6/19	6/26	7/3	7/10	7/17	7/24	7/31	8/7	8/14	8/21	8/28	9/4	9/11	9/18	9/25	10/2

As per Contract	—
As per Actual	……

The activity stand completed

Annex-2A-2

Project No. MP/PAK/01/226- UNIDO Contract No. 16001351

Coversion of Carbon Tetrachloride (CTC) as Process Solvent to 1,2- Dichloroethane at Zafa Chemie

Work Schedule for Erection, Installation, testing and commissioning of Chilling Plant

Sr. #	Activity/ Sub-activity	Weeks																																																					
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
1	Shifting of equipment to job site						……		——																																														
2	Uncrating & physical inspection						……		——																																														
3	Installation of equipment at foundation							……		——																																													
4	Connection with the pipeline								……		——																																												
5	Testing & Commissioning								……		——																																												
6	Trial Run									……		——																																											
Commencement Date: September 20, 2007		9/27	10/4	10/11	10/18	10/25	11/1	11/8	11/15	11/22	11/29	12/6	12/13	12/20	12/27	1/3	1/10	1/17	1/24	1/31	2/7	2/14	2/21	2/28	3/6	3/13	3/20	3/27	4/3	4/10	4/17	4/24	5/1	5/8	5/15	5/22	5/29	6/5	6/12	6/19	6/26	7/3	7/10	7/17	7/24	7/31	8/7	8/14	8/21	8/28	9/4	9/11	9/18	9/25	10/2

As per Contract ——
As per Actual ……

The activity stand completed

Annex-2A-3

Project No. MP/PAK/01/226- UNIDO Contract No. 16001351

Coversion of Carbon Tetrachloride (CTC) as Process Solvent to 1,2- Dichloroethane at Zafa Chemie

Work Schedule for Erection, Installation, testing and commissioning of Steam Boiler

Sr. #	Activity/ Sub-activity	Weeks																																																					
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
1	Shifting of equipment to job site								—			......																																											
2	Uncrating & physical inspection								—			......																																											
3	Installation of equipment at foundation									—			......																																									
4	Connection with the pipeline										—																																......	......	......	......	......	......	......	......	......	......	......		
5	Testing & Commissioning										—																																......	......	......	......	......	......	......	......	......	......	......	......	
6	Trial Run											—																															......	......	......	......	......	......	......	......	......	......	......	......	
Commencement Date: September 20, 2007		9/27	10/4	10/11	10/18	10/25	11/1	11/8	11/15	11/22	11/29	12/6	12/13	12/20	12/27	1/3	1/10	1/17	1/24	1/31	2/7	2/14	2/21	2/28	3/6	3/13	3/20	3/27	4/3	4/10	4/17	4/24	5/1	5/8	5/15	5/22	5/29	6/5	6/12	6/19	6/26	7/3	7/10	7/17	7/24	7/31	8/7	8/14	8/21	8/28	9/4	9/11	9/18	9/25	10/2

As per Contract —
As per Actual ......

The activity stand completed

Annex-2B-1

Project No. MP/PAK/01/226- UNIDO Contract No. 16001351

Coversion of Carbon Tetrachloride (CTC) as Process Solvent to 1,2- Dichloroethane at Zafa Chemie

Work Schedule for Supplay, Erection, Installation, testing and commissioning of 3,000 litre glass lined reactor with stirrer (Friedel-Craft-Reactor)

Sr. #	Activity/ Sub-activity	Weeks																																																						
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
1	Identification & short listing of supplier/ vendor	— ···																																																					
2	Request for quotation & tendering period		— ···	— ···	— ···	— ···																																																	
3	Evaluation of proposals						— ···																																															
4	Final selection & preparation of purchase order						— ···																																															
5	Placement of purchase order & opening of Letter of Credit						— ···																																															
6	Factory Inspection							— ···	— ···	— ···	— ···																																											
7	Shipment of equipment to Karachi port											— ···	— ···	— ···	— ···	···	···	···	···																																			
8	Port cllearance at Karachi														—					···	···	···	···	···	···	···	···	···	···																									
9	In land transporatation to project site Lahore															—														···																								
10	Shifting of equipment to job site															—															···																							
11	Uncrating & physical inspection															—																···																						
12	Installation of equipment at foundation																—															···	···	···	···																		
13	Connection with the pipeline																	—														···	···	···	···																		
14	Testing & Commissioning																	—														···	···	···	···																		
15	Trial Run																		—																																···	···	···	
Commencement Date: September 20, 2007		9/27	10/4	10/11	10/18	10/25	11/1	11/8	11/15	11/22	11/29	12/6	12/13	12/20	12/27	1/3	1/10	1/17	1/24	1/31	2/7	2/14	2/21	2/28	3/6	3/13	3/20	3/27	4/3	4/10	4/17	4/24	5/1	5/8	5/15	5/22	5/29	6/5	6/12	6/19	6/26	7/3	7/10	7/17	7/24	7/31	8/7	8/14	8/21	8/28	9/4	9/11	9/18	9/25	10/2

As per Contract —
As per Actual ···

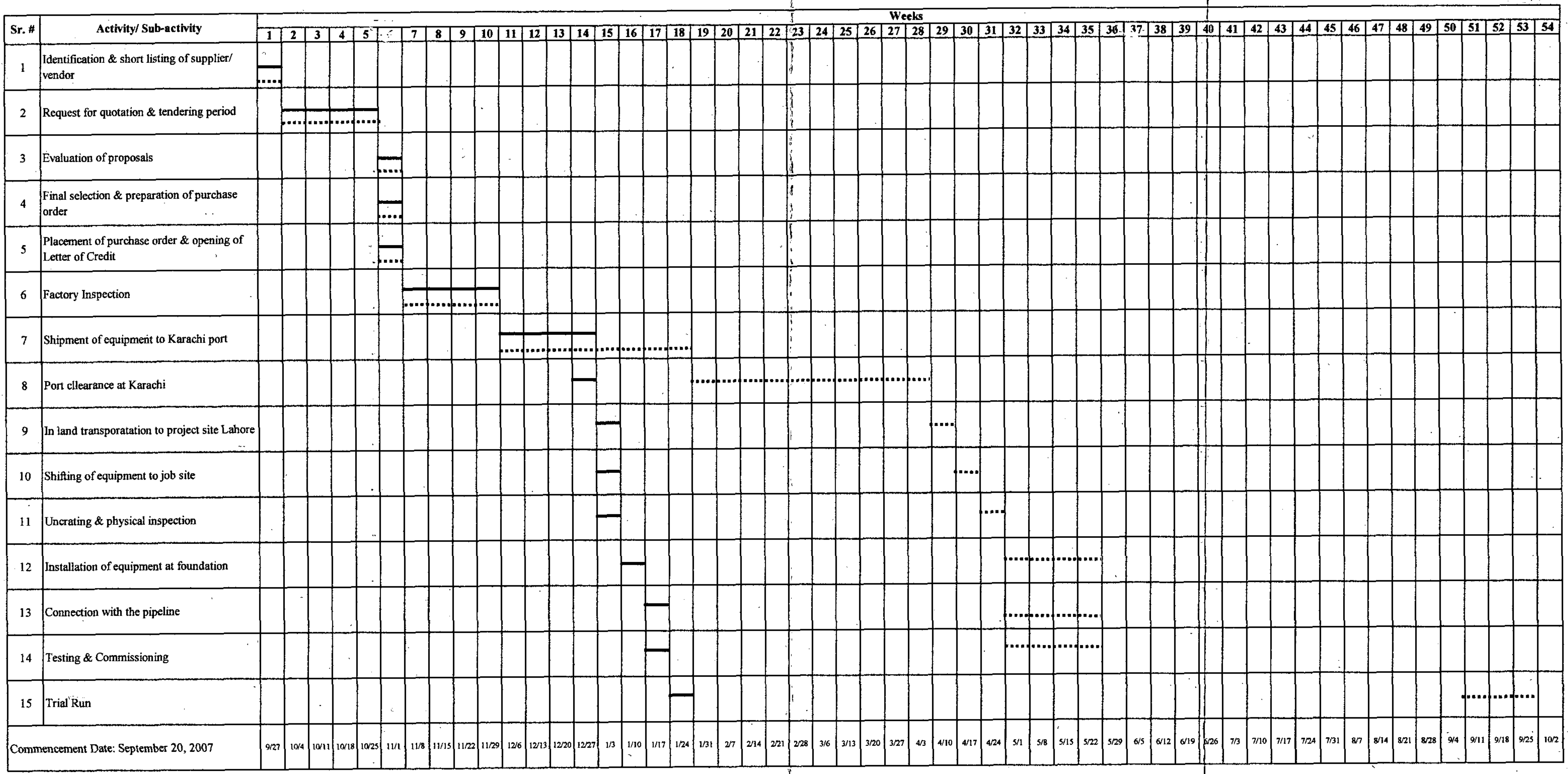
The activity stand completed

Annex-2B-2

Project No. MP/PAK/01/226- UNIDO Contract No. 16001351

Coversion of Carbon Tetrachloride (CTC) as Process Solvent to 1,2- Dichloroethane at Zafa Chemie

Work Schedule for Supplay, Erection, Installation, testing and commissioning of 5,000 litre reactor with stirrer (Quencher/Separtor)



As per Contract ——
As per Actual ……

The activity stand completed

Annex-2B-3

Project No. MP/PAK/01/226- UNIDO Contract No. 16001351

Coversion of Carbon Tetrachloride (CTC) as Process Solvent to 1,2- Dichloroethane at Zafa Chemie

Work Schedule for Supplay, Erection, Installation, testing and commissioning of 3,000 litre reactor with stirrer (Holder Vessle)

Sr. #	Activity/ Sub-activity	Weeks																										
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	Identification & short listing of supplier/ vendor	— ···																										
2	Request for quotation & tendering period		— ···	— ···	— ···	— ···																						
3	Evaluation of proposals						— ···																					
4	Final selection & preparation of purchase order						— ···																					
5	Placement of purchase order & opening of Letter of Credit						— ···																					
6	Factory Inspection							— ···	— ···	— ···	— ···																	
7	Shipment of equipment to Karachi port											— ···	— ···	— ···	— ···	···	···	···	···									
8	Port clearance at Karachi														—					···	···	···	···	···	···	···	···	···
9	In land transporatation to project site Lahore															—												
10	Shifting of equipment to job site															—												
11	Uncrating & physical inspection															—												
12	Installation of equipment at foundation																—											
13	Connection with the pipeline																	—										
14	Testing & Commissioning																	—										
15	Trial Run																		—									
Commencement Date: September 20, 2007		9/27	10/4	10/11	10/18	10/25	11/1	11/8	11/15	11/22	11/29	12/6	12/13	12/20	12/27	1/3	1/10	1/17	1/24	1/31	2/7	2/14	2/21	2/28	3/6	3/13	3/20	3/27

Sr. #	Activity/ Sub-activity	Weeks																										
		28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
1	Identification & short listing of supplier/ vendor																											
2	Request for quotation & tendering period																											
3	Evaluation of proposals																											
4	Final selection & preparation of purchase order																											
5	Placement of purchase order & opening of Letter of Credit																											
6	Factory Inspection																											
7	Shipment of equipment to Karachi port																											
8	Port clearance at Karachi	···																										
9	In land transporatation to project site Lahore		···																									
10	Shifting of equipment to job site			···																								
11	Uncrating & physical inspection				···																							
12	Installation of equipment at foundation					···	···	···	···																			
13	Connection with the pipeline					···	···	···	···																			
14	Testing & Commissioning					···	···	···	···																			
15	Trial Run																								···	···	···	
Commencement Date: September 20, 2007		4/3	4/10	4/17	4/24	5/1	5/8	5/15	5/22	5/29	6/5	6/12	6/19	6/26	7/3	7/10	7/17	7/24	7/31	8/7	8/14	8/21	8/28	9/4	9/11	9/18	9/25	10/2

As per Contract —
As per Actual ···

The activity stand completed

Annex-2B-4

Project No. MP/PAK/01/226- UNIDO Contract No. 16001351

Coversion of Carbon Tetrachloride (CTC) as Process Solvent to 1,2- Dichloroethane at Zafa Chemie

Work Schedule for Supplay, Erection, Installation, testing and commissioning of 3,000 litre reactor with stirrer (Nouterlization, Drawing, Solvent recovery)

Sr. #	Activity/ Sub-activity	Weeks																																																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
1	Identification & short listing of supplier/ vendor	—																																																					
2	Request for quotation & tendering period		—	—	—	—																																																	
3	Evaluation of proposals						—																																																
4	Final selection & preparation of purchase order						—																																																
5	Placement of purchase order & opening of Letter of Credit						—																																																
6	Factory Inspection							—	—	—	—																																												
7	Shipment of equipment to Karachi port											—	—	—	—																																								
8	Port cllearance at Karachi														—																																								
9	In land transporatation to project site Lahore	.....	.....													—																																							
10	Shifting of equipment to job site			.....												—																																							
11	Uncrating & physical inspection			.....												—																																							
12	Installation of equipment at foundation				.....												—																																						
13	Connection with the pipeline				.....													—																																					
14	Testing & Commissioning				.....													—																																					
15	Trial Run					.....													—																																				
Commencement Date: September 20, 2007		9/27	10/4	10/11	10/18	10/25	11/1	11/8	11/15	11/22	11/29	12/6	12/13	12/20	12/27	1/3	1/10	1/17	1/24	1/31	2/7	2/14	2/21	2/28	3/6	3/13	3/20	3/27	4/3	4/10	4/17	4/24	5/1	5/8	5/15	5/22	5/29	6/5	6/12	6/19	6/26	7/3	7/10	7/17	7/24	7/31	8/7	8/14	8/21	8/28	9/4	9/11	9/18	9/25	10/2

As per Contract —
As per Actual .....

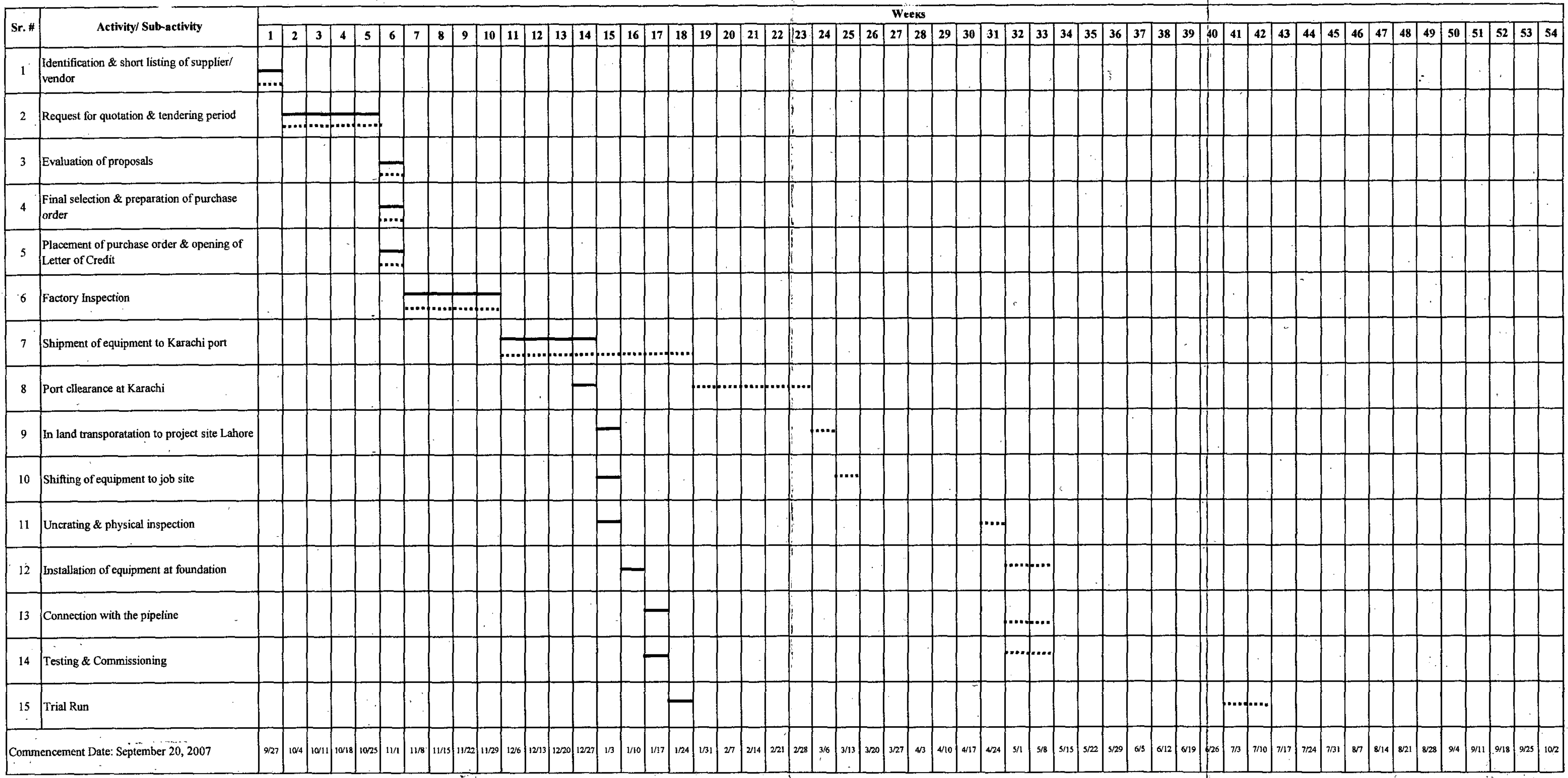
The activity stand completed

Annex-2B-5

Project No. MP/PAK/01/226- UNIDO Contract No. 16001351

Coversion of Carbon Tetrachloride (CTC) as Process Solvent to 1,2- Dichloroethane at Zafa Chemie

Work Schedule for Supplay, Erection, Installation, testing and commissioning of Tubler type condenser surface area of 8 M2 of stainless steel 316.



As per Contract ▬
As per Actual ┅

The activity stand completed

Project No. MP/PAK/01/226- UNIDO Contract No. 16001351

Coversion of Carbon Tetrachloride (CTC) as Process Solvent to 1,2- Dichloroethane at Zafa Chemie

Work Schedule for Supplay, Erection, Installation, testing and commissioning of Tubler type condenser surface area of 4 M2 of stainless steel 316.

Sr. #	Activity/ Sub-activity	Weeks																																																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
1	Identification & short listing of supplier/ vendor	— ……																																																					
2	Request for quotation & tendering period		— ……	— ……	— ……	— ……																																																	
3	Evaluation of proposals						— ……																																																
4	Final selection & preparation of purchase order						— ……																																																
5	Placement of purchase order & opening of Letter of Credit						— ……																																																
6	Factory Inspection							— ……	— ……	— ……	— ……																																												
7	Shipment of equipment to Karachi port											— ……	— ……	— ……	— ……	……	……	……	……																																				
8	Port cllearance at Karachi														—					……	……	……	……	……																															
9	In land transporatation to project site Lahore															—									……																														
10	Shifting of equipment to job site															—										……																													
11	Uncrating & physical inspection															—																……																							
12	Installation of equipment at foundation																—																……	……																					
13	Connection with the pipeline																	—															……	……																					
14	Testing & Commissioning																	—															……	……																					
15	Trial Run																		—																							……	……												
Commencement Date: September 20, 2007		9/27	10/4	10/11	10/18	10/25	11/1	11/8	11/15	11/22	11/29	12/6	12/13	12/20	12/27	1/3	1/10	1/17	1/24	1/31	2/7	2/14	2/21	2/28	3/6	3/13	3/20	3/27	4/3	4/10	4/17	4/24	5/1	5/8	5/15	5/22	5/29	6/5	6/12	6/19	6/26	7/3	7/10	7/17	7/24	7/31	8/7	8/14	8/21	8/28	9/4	9/11	9/18	9/25	10/2

As per Contract —
As per Actual ……

The activity stand completed

Annex-2B-7

Project No. MP/PAK/01/226- UNIDO Contract No. 16001351

Coversion of Carbon Tetrachloride (CTC) as Process Solvent to 1,2- Dichloroethane at Zafa Chemie

Work Schedule for Supplay, Erection, Installation, testing and commissioning of Vaccum Pump

Sr. #	Activity/ Sub-activity	Weeks																																																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
1	Identification & short listing of supplier/ vendor	— ····																																																					
2	Request for quotation & tendering period		— ····	— ····	— ····	— ····																																																	
3	Evaluation of proposals						— ····																																																
4	Final selection & preparation of purchase order						— ····																																																
5	Placement of purchase order & opening of Letter of Credit						— ····																																																
6	Factory Inspection							— ····	— ····	— ····	— ····																																												
7	Shipment of equipment to Karachi port											— ····	— ····	— ····	— ····	····	····	····	····																																				
8	Port cllearance at Karachi														—					····	····	····	····	····																															
9	In land transporatation to project site Lahore															—									····																														
10	Shifting of equipment to job site															—										····																													
11	Uncrating & physical inspection															—																····																							
12	Installation of equipment at foundation																—																····	····																					
13	Connection with the pipeline																	—															····	····																					
14	Testing & Commissioning																	—															····	····																					
15	Trial Run																		—																							····	····												
Commencement Date: September 20, 2007		###	10/4	10/11	10/18	10/25	11/1	11/8	11/15	11/22	11/29	12/6	12/13	12/20	12/27	1/3	1/10	1/17	1/24	1/31	2/7	2/14	2/21	2/28	3/6	3/13	3/20	3/27	4/3	4/10	4/17	4/24	5/1	5/8	5/15	5/22	5/29	6/5	6/12	6/19	6/26	7/3	7/10	7/17	7/24	7/31	8/7	8/14	8/21	8/28	9/4	9/11	9/18	9/25	10/2

As per Contract —
As per Actual ····

The activity stand completed

Annex-2C-1

Project No. MP/PAK/01/226- UNIDO Contract No. 16001351

Coversion of Carbon Tetrachloride (CTC) as Process Solvent to 1,2- Dichloroethane at Zafa Chemie

Work Schedule for Supplay, Erection, Installation, testing and commissioning of 1,000 litre stainless steel distillate receiver

Sr. #	Activity/ Sub-activity	Weeks																																																					
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
1	Identification & short listing of supplier/ vendor	━ ┅																																																					
2	Request for quotation & tendering period		━ ┅	━ ┅	━ ┅	━ ┅																																																	
3	Evaluation of proposals						━ ┅																																																
4	Final selection & preparation of purchase order						━ ┅																																																
5	Placement of purchase order & opening of Letter of Credit						━ ┅																																																
6	Factory Inspection							━ ┅	━ ┅	━ ┅	━ ┅																																												
7	Shipment of equipment to Karachi port											━ ┅	━ ┅	━ ┅	━ ┅	┅	┅	┅	┅																																				
8	Port cllearance at Karachi														━					┅	┅	┅	┅	┅																															
9	In land transporatation to project site Lahore															━									┅																														
10	Shifting of equipment to job site															━										┅																													
11	Uncrating & physical inspection															━																┅																							
12	Installation of equipment at foundation																━																┅	┅																					
13	Connection with the pipeline																	━															┅	┅																					
14	Testing & Commissioning																	━															┅	┅																					
15	Trial Run																		━																							┅	┅												
Commencement Date: September 20, 2007		9/27	10/4	10/11	10/18	10/25	11/1	11/8	11/15	11/22	11/29	12/6	12/13	12/20	12/27	1/3	1/10	1/17	1/24	1/31	2/7	2/14	2/21	2/28	3/6	3/13	3/20	3/27	4/3	4/10	4/17	4/24	5/1	5/8	5/15	5/22	5/29	6/5	6/12	6/19	6/26	7/3	7/10	7/17	7/24	7/31	8/7	8/14	8/21	8/28	9/4	9/11	9/18	9/25	10/2

As per Contract ━━━
As per Actual ┅┅┅

The activity stand completed

Annex-2C-2

Project No. MP/PAK/01/226- UNIDO Contract No. 16001351

Coversion of Carbon Tetrachloride (CTC) as Process Solvent to 1,2- Dichloroethane at Zafa Chemie

Work Schedule for Supplay, Erection, Installation, testing and commissioning of 3,000 litre stainless steel distillate receiver

Sr. #	Activity/ Sub-activity	Weeks																																																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
1	Identification & short listing of supplier/ vendor	— ····																																																					
2	Request for quotation & tendering period		— ····	— ····	— ····	— ····																																																	
3	Evaluation of proposals						— ····																																																
4	Final selection & preparation of purchase order						— ····																																																
5	Placement of purchase order & opening of Letter of Credit						— ····																																																
6	Factory Inspection							— ····	— ····	— ····	— ····																																												
7	Shipment of equipment to Karachi port											— ····	— ····	— ····	— ····	····	····	····	····																																				
8	Port cllearance at Karachi														—					····	····	····	····	····																															
9	In land transporatation to project site Lahore															—									····																														
10	Shifting of equipment to job site															—										····																													
11	Uncrating & physical inspection															—																····																							
12	Installation of equipment at foundation																—																····	····																					
13	Connection with the pipeline																	—															····	····																					
14	Testing & Commissioning																	—															····	····																					
15	Trial Run																		—																							····	····												
Commencement Date: September 20, 2007		9/27	10/4	10/11	10/18	10/25	11/1	11/8	11/15	11/22	11/29	12/6	12/13	12/20	12/27	1/3	1/10	1/17	1/24	1/31	2/7	2/14	2/21	2/28	3/6	3/13	3/20	3/27	4/3	4/10	4/17	4/24	5/1	5/8	5/15	5/22	5/29	6/5	6/12	6/19	6/26	7/3	7/10	7/17	7/24	7/31	8/7	8/14	8/21	8/28	9/4	9/11	9/18	9/25	10/2

As per Contract —
As per Actual ····

The activity stand completed

Annex-2D

Project No. MP/PAK/01/226- UNIDO Contract No. 16001351
Coversion of Carbon Tetrachloride (CTC) as Process Solvent to 1,2- Dichloroethane at Zafa Chemie
Work Schedule for Dismanteling of existing equipment

Sr. #	Activity/ Sub-activity	Weeks																																																				
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
1	3,000 litre reactor with stirrer.														—																		……	……																					
2	5,000 litre reactor with stirrer (quencher/ separator).														—																		……	……																					
3	3,000 litre holder vessel (holder vessel).														—																		……	……																					
4	3,000 litre reactor with stirrer (neutralisation, drying, solvent recovery).	—																																																					
5	1,000 litre stainless steel distillate receiver														—																		……	……																					
6	3,000 litre stainless steel distillate receiver														—																		……	……																					
7	Condenser surface area of 8 M^2														—																		……	……																					
8	Condenser surface area of 4 M^2														—																		……	……																					
9	Vacuum pump type water ring		—																														……	……																					
Commencement Date: September 20, 2007		###	###	###	###	###	###	###	###	###	###	###	###	###	###	1/3	###	###	###	###	2/7	###	###	###	3/6	###	###	###	4/3	###	###	###	5/1	5/8	###	###	###	6/5	###	###	###	7/3	###	###	###	###	8/7	###	###	###	9/4	###	###	###	###

As per Contract —
As per Actual ……

The activity stand completed

Annex-2E-1

Project No. MP/PAK/01/226- UNIDO Contract No. 16001351

Coversion of Carbon Tetrachloride (CTC) as Process Solvent to 1,2- Dichloroethane at Zafa Chemie

Work Schedule for Piping works including supplly, erection, installation, testing and commissioning of Pipeline from Nitrogen Generator to apparatusses.

Sr. #	Activity/ Sub-activity	Weeks																																																					
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
1	Procurement of 1.5" S/S pipe & accessories fittings & valves	—	—	—	—	—	⋯	⋯	⋯	⋯																																													
2	Installation of S/S pipes upto building 3, 2, 1, 4, & 5						—	—	—	—																												⋯	⋯	⋯	⋯														
3	Connection with the Nitrogen Generation											—																														⋯													
4	Testing & Commisioning											—																															⋯												
Commencement Date: September 20, 2007		9/27	10/4	10/11	10/18	10/25	11/1	11/8	11/15	11/22	11/29	12/6	12/13	12/20	12/27	1/3	1/10	1/17	1/24	1/31	2/7	2/14	2/21	2/28	3/6	3/13	3/20	3/27	4/3	4/10	4/17	4/24	5/1	5/8	5/15	5/22	5/29	6/5	6/12	6/19	6/26	7/3	7/10	7/17	7/24	7/31	8/7	8/14	8/21	8/28	9/4	9/11	9/18	9/25	10/2

As per Contract	—
As per Actual	⋯

The activity stand completed

Annex-2E-2

Project No. MP/PAK/01/226- UNIDO Contract No. 16001351
Coversion of Carbon Tetrachloride (CTC) as Process Solvent to 1,2- Dichloroethane at Zafa Chemie

Work Schedule for Piping works including supplly, erection, installation, testing and commissioning of Pipeline from Chilling Plant to apparatusses

Sr. #	Activity/ Sub-activity	Weeks																																																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
1	Procurement of 1.5" S/S pipe & accessories fittings & valves	━ ┅	━ ┅	━ ┅	━ ┅																																																		
2	Installation of S/S pipes upto building 3, 2, 1, 4, & 5					━ ┅	━ ┅	━ ┅	━ ┅																																														
3	Connection with the Chilling Plant										━ ┅																																												
4	Testing & Commisioning										━ ┅																																												
Commencement Date: September 20, 2007		9/27	10/4	10/11	10/18	10/25	11/1	11/8	11/15	11/22	11/29	12/6	12/13	12/20	12/27	1/3	1/10	1/17	1/24	1/31	2/7	2/14	2/21	2/28	3/6	3/13	3/20	3/27	4/3	4/10	4/17	4/24	5/1	5/8	5/15	5/22	5/29	6/5	6/12	6/19	6/26	7/3	7/10	7/17	7/24	7/31	8/7	8/14	8/21	8/28	9/4	9/11	9/18	9/25	10/2

As per Contract	━
As per Actual	┅

The activity stand completed

Annex-2E-3

Project No. MP/PAK/01/226- UNIDO Contract No. 16001351
Coversion of Carbon Tetrachloride (CTC) as Process Solvent to 1,2- Dichloroethane at Zafa Chemie
Work Schedule for Piping works including supplly, erection, installation, testing and commissioning of Pipeline from Vacuum Pump to apparatusses

Sr. #	Activity/ Sub-activity	Weeks																																																					
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
1	Procurement of 1.5" S/S pipe & accessories fittings & valves	—	—	—	—	—	......	......	......	......																																													
2	Installation of S/S pipes upto building # 3						—																															......																	
3	Connection with the Vaccum Pump																	—																								......	......												
4	Testing & Commisioning																	—																																				......	
Commencement Date: September 20, 2007		9/27	10/4	10/11	10/18	10/25	11/1	11/8	11/15	11/22	11/29	12/6	12/13	12/20	12/27	1/3	1/10	1/17	1/24	1/31	2/7	2/14	2/21	2/28	3/6	3/13	3/20	3/27	4/3	4/10	4/17	4/24	5/1	5/8	5/15	5/22	5/29	6/5	6/12	6/19	6/26	7/3	7/10	7/17	7/24	7/31	8/7	8/14	8/21	8/28	9/4	9/11	9/18	9/25	10/2

As per Contract —
As per Actual ......

The activity stand completed

Annex-2E-4

Project No. MP/PAK/01/226- UNIDO Contract No. 16001351
Coversion of Carbon Tetrachloride (CTC) as Process Solvent to 1,2- Dichloroethane at Zafa Chemie

Work Schedule for Piping works including supply, erection, installation, testing and commissioning of Pipeline from Steam boiler to apparatusses

Sr. #	Activity/ Sub-activity	Weeks																										
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	Procurement of 1.5" S/S pipe & accessories fittings & valves	━	━	━	━	┅	┅	┅	┅																			
2	Installation of S/S pipes upto building 3, 2, 1, 4, & 5					━	━	━	━																			
3	Connection with the Steam Boiler										━																	
4	Testing & Commisioning										━																	
Commencement Date: September 20, 2007		9/27	10/4	10/11	10/18	10/25	11/1	11/8	11/15	11/22	11/29	12/6	12/13	12/20	12/27	1/3	1/10	1/17	1/24	1/31	2/7	2/14	2/21	2/28	3/6	3/13	3/20	3/27

Sr. #	Activity/ Sub-activity	Weeks																										
		28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
1	Procurement of 1.5" S/S pipe & accessories fittings & valves																											
2	Installation of S/S pipes upto building 3, 2, 1, 4, & 5									┅	┅	┅	┅															
3	Connection with the Steam Boiler																							┅	┅	┅		
4	Testing & Commisioning																										┅	
Commencement Date: September 20, 2007		4/3	4/10	4/17	4/24	5/1	5/8	5/15	5/22	5/29	6/5	6/12	6/19	6/26	7/3	7/10	7/17	7/24	7/31	8/7	8/14	8/21	8/28	9/4	9/11	9/18	9/25	10/2

As per Contract	━
As per Actual	┅

The activity stand completed

Annex-2F-1

Project No. MP/PAK/01/226- UNIDO Contract No. 16001351
Coversion of Carbon Tetrachloride (CTC) as Process Solvent to 1,2- Dichloroethane at Zafa Chemie

Work Schedule for Civil works associated with the erection, installation, testing and commissioning of Nitrogen Generator including air compressor

Sr. #	Activity/ Sub-activity	Weeks																																																					
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
1	Demarkation and area cleaning	—			......																																																		
2	Excavation and Compaction	—	—					......																																															
3	Foundation & civil works upto DPC		—	—					......	......																																													
4	Brick mesory uotp roop				—	—					......	......	......	......																																									
5	Placement of pretab slabs						—								......	......																																							
6	plasturing of walls							—									......	......																																					
7	Flooring								—										......	......																																			
8	Fixing of windows & doors							—	—												......																																		
9	Painting of walls & roof									—												......	......																																
Commencement Date: September 20, 2007		9/27	10/4	10/11	10/18	10/25	11/1	11/8	11/15	11/22	11/29	12/6	12/13	12/20	12/27	1/3	1/10	1/17	1/24	1/31	2/7	2/14	2/21	2/28	3/6	3/13	3/20	3/27	4/3	4/10	4/17	4/24	5/1	5/8	5/15	5/22	5/29	6/5	6/12	6/19	6/26	7/3	7/10	7/17	7/24	7/31	8/7	8/14	8/21	8/28	9/4	9/11	9/18	9/25	10/2

As per Contract	—
As per Actual	......

The activity stand completed

Annex-2F-2

Project No. MP/PAK/01/226- UNIDO Contract No. 16001351
Coversion of Carbon Tetrachloride (CTC) as Process Solvent to 1,2- Dichloroethane at Zafa Chemie

Work Schedule for Civil works associated with the erection, installation, testing and commissioning of Chilling Plant

Sr. #	Activity/ Sub-activity	Weeks																																																					
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
1	Demarkation and area cleaning	——																																																					
2	Excavation and Compaction		——																																																				
3	Foundation's farm work			——																																																			
4	Foundation Concrete Poring				——																																																		
5	Concrete curing					——	——	——	....	......																																													
Commencement Date: September 20, 2007		9/27	10/4	10/11	10/18	10/25	11/1	11/8	11/15	11/22	11/29	12/6	12/13	12/20	12/27	1/3	1/10	1/17	1/24	1/31	2/7	2/14	2/21	2/28	3/6	3/13	3/20	3/27	4/3	4/10	4/17	4/24	5/1	5/8	5/15	5/22	5/29	6/5	6/12	6/19	6/26	7/3	7/10	7/17	7/24	7/31	8/7	8/14	8/21	8/28	9/4	9/11	9/18	9/25	10/2

As per Contract ——
As per Actual ......

The activity stand completed

Project No. MP/PAK/01/226- UNIDO Contract No. 16001351
Coversion of Carbon Tetrachloride (CTC) as Process Solvent to 1,2- Dichloroethane at Zafa Chemie
Work Schedule for Civil works associated with the erection, installation, testing and commissioning of Steam Boiler

Sr. #	Activity/ Sub-activity	Weeks																										
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	Demarkation and area cleaning	——		......																								
2	Excavation and Compaction		——		......																							
3	Foundation's farm work			——		......																						
4	Foundation Concrete Poring				——	——	......	......																				
5	Concrete curing						——	——	——	......	......	......	......															
Commencement Date: September 20, 2007		9/27	10/4	10/11	10/18	10/25	11/1	11/8	11/15	11/22	11/29	12/6	12/13	12/20	12/27	1/3	1/10	1/17	1/24	1/31	2/7	2/14	2/21	2/28	3/6	3/13	3/20	3/27

Sr. #	Activity/ Sub-activity	Weeks																										
		28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
1	Demarkation and area cleaning																											
2	Excavation and Compaction																											
3	Foundation's farm work																											
4	Foundation Concrete Poring																											
5	Concrete curing																											
Commencement Date: September 20, 2007		4/3	4/10	4/17	4/24	5/1	5/8	5/15	5/22	5/29	6/5	6/12	6/19	6/26	7/3	7/10	7/17	7/24	7/31	8/7	8/14	8/21	8/28	9/4	9/11	9/18	9/25	10/2

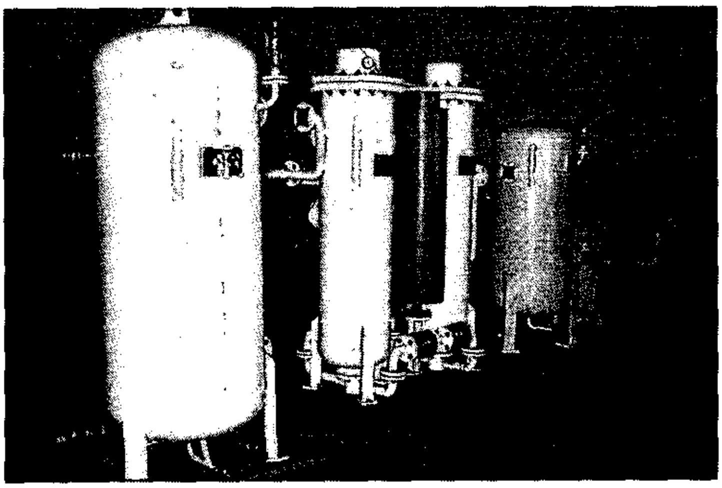
As per Contract ——
As per Actual ......

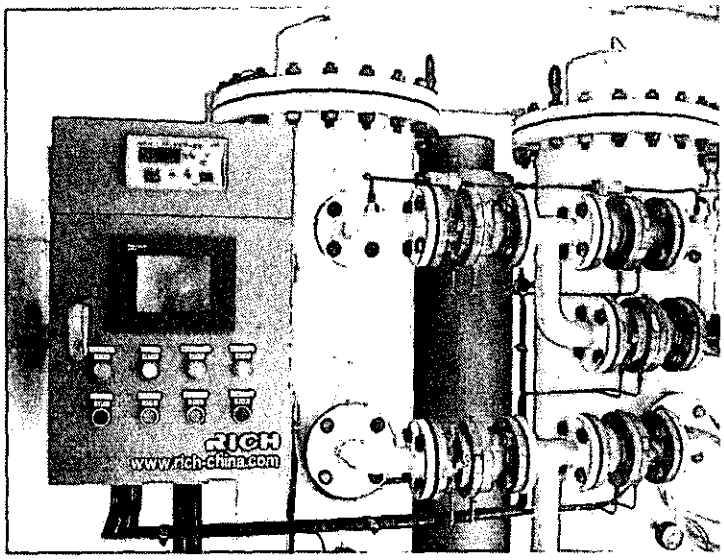
The activity stand completed

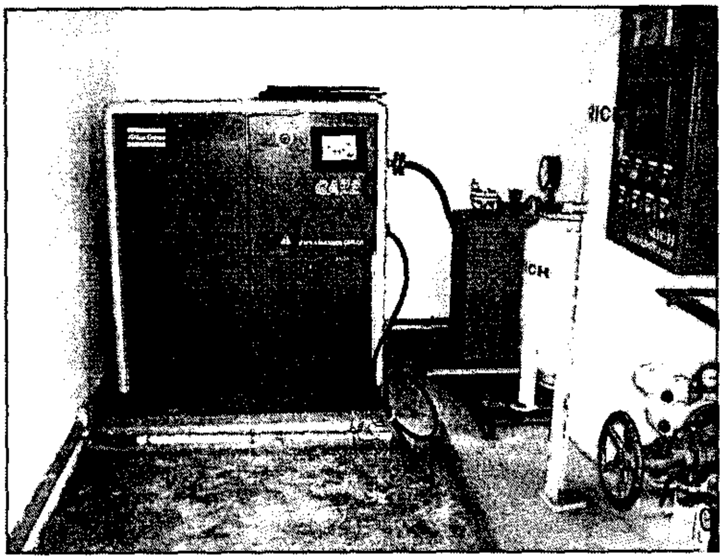
ANNEX-3

PHOTOGRAPHS SHOWING WORK PROGRESS

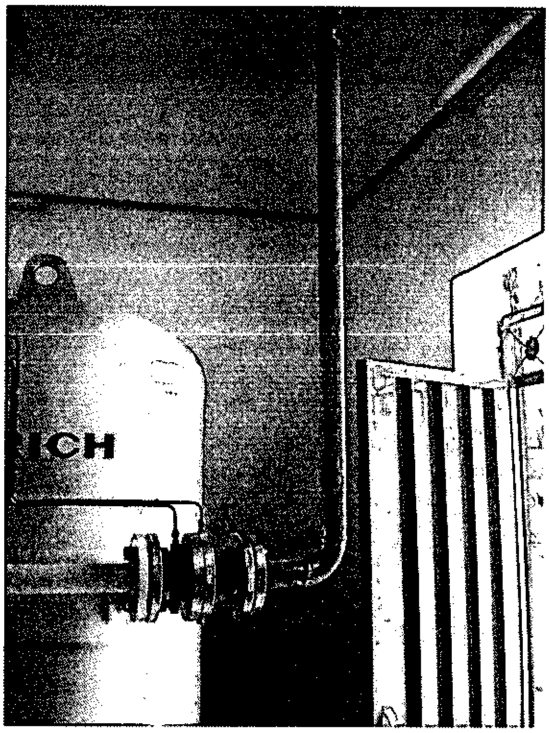
A-1, E-1 & F1 Erection, Installation, testing and commissioning of Nitrogen Generator

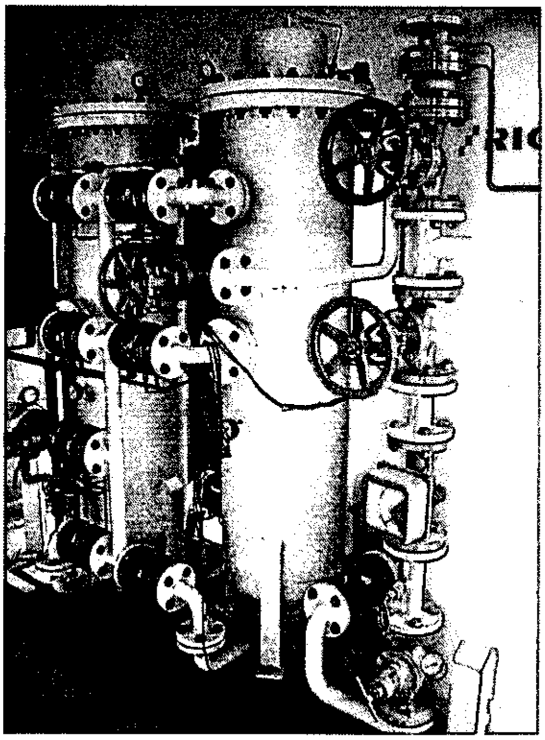




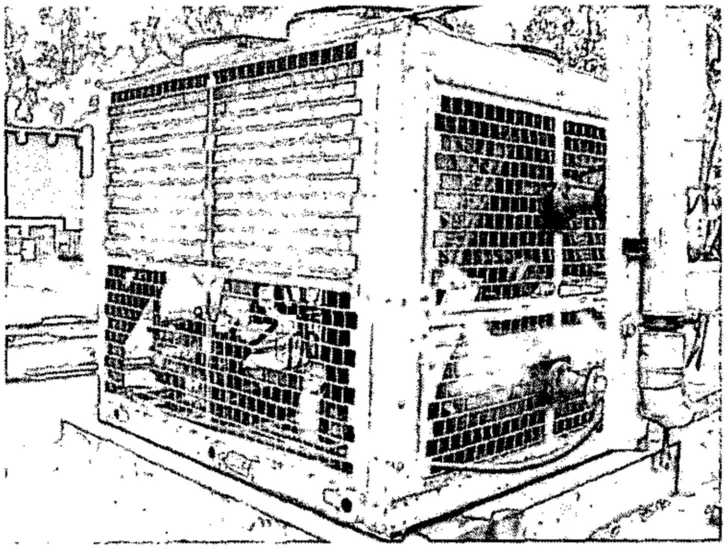


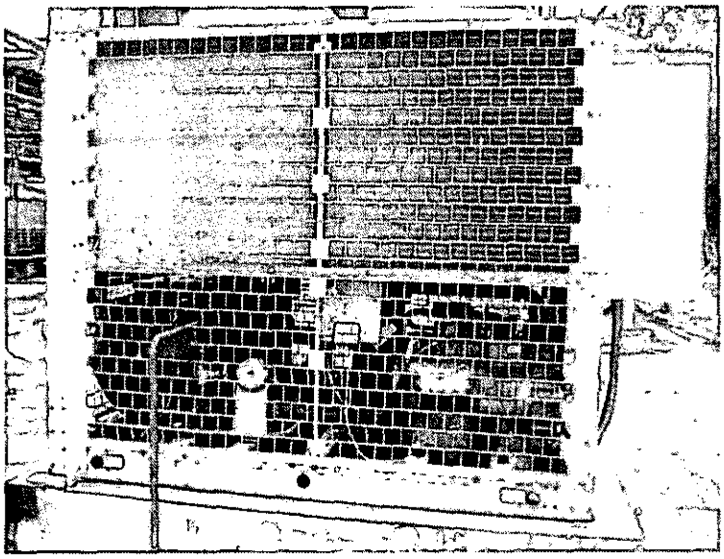
A-1, E-1 & F1 **Erection, Installation, testing and commissioning of Nitrogen Generator**

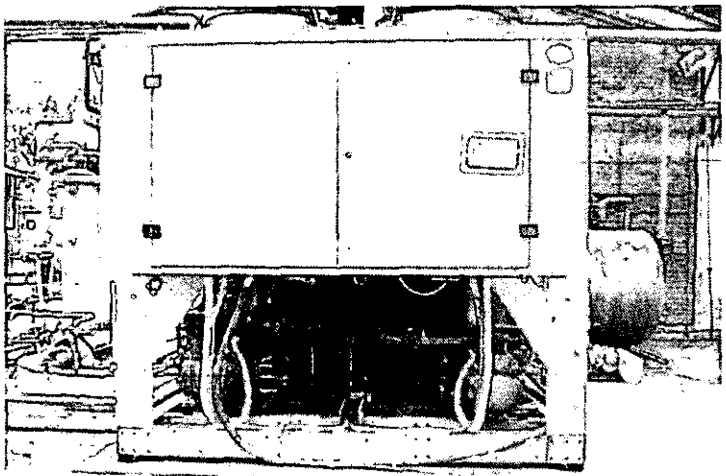




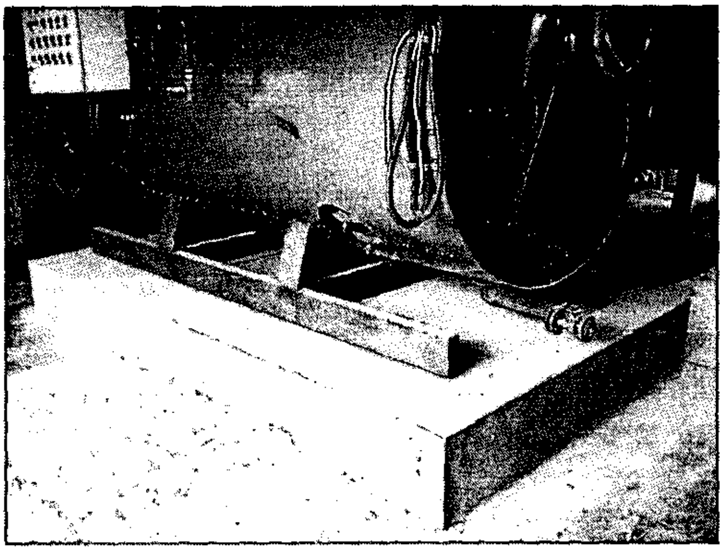
A-2, E2 & F2 Erection, Installation, testing and commissioning of Chilling Plant

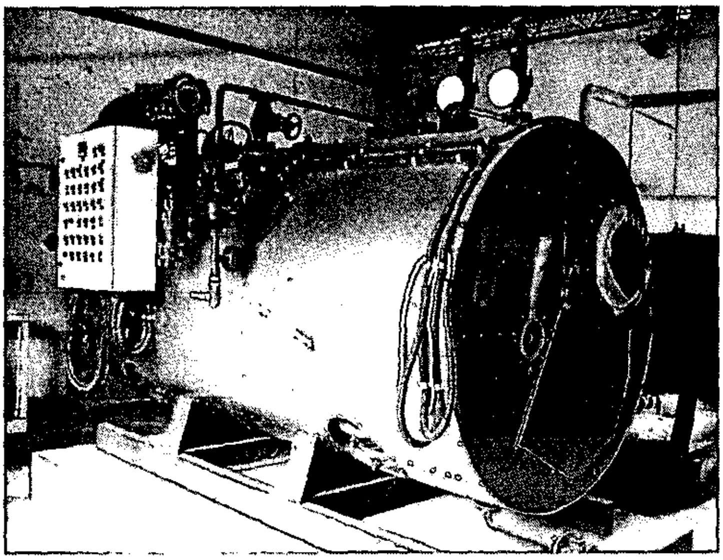


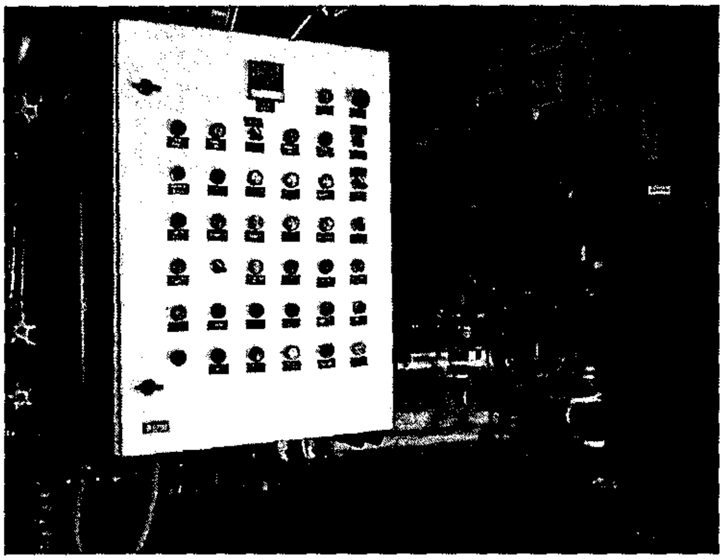




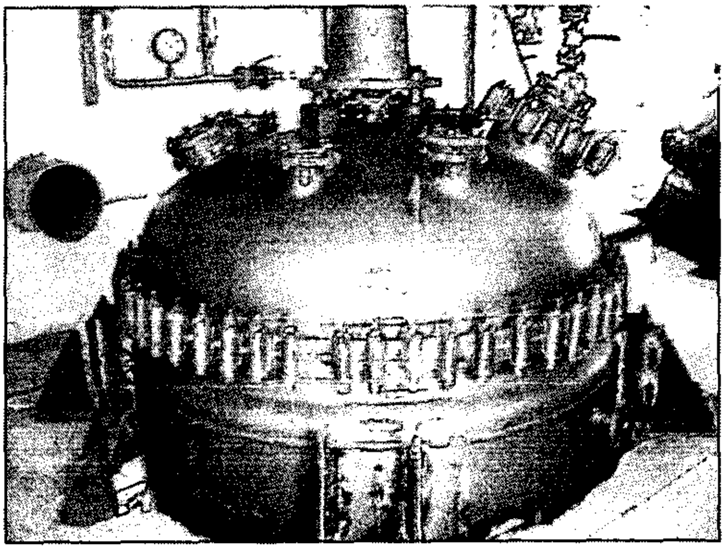
A-3, E4 & F3 **Steam Boiler Erection, Installation, testing and commissioning of**

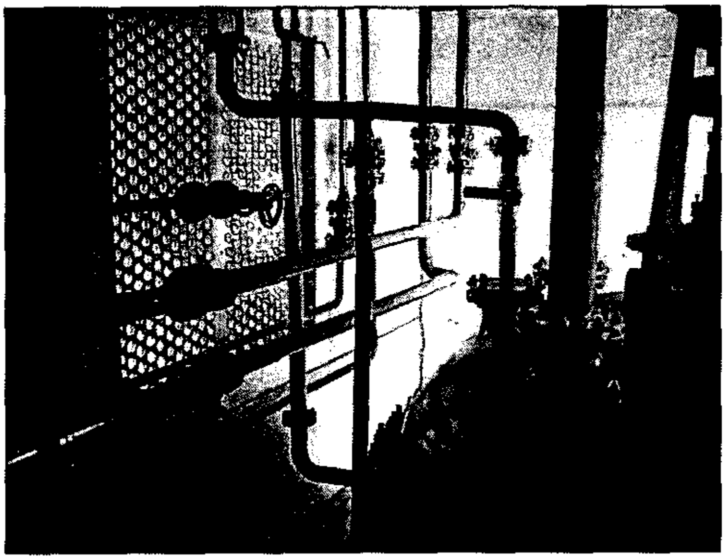


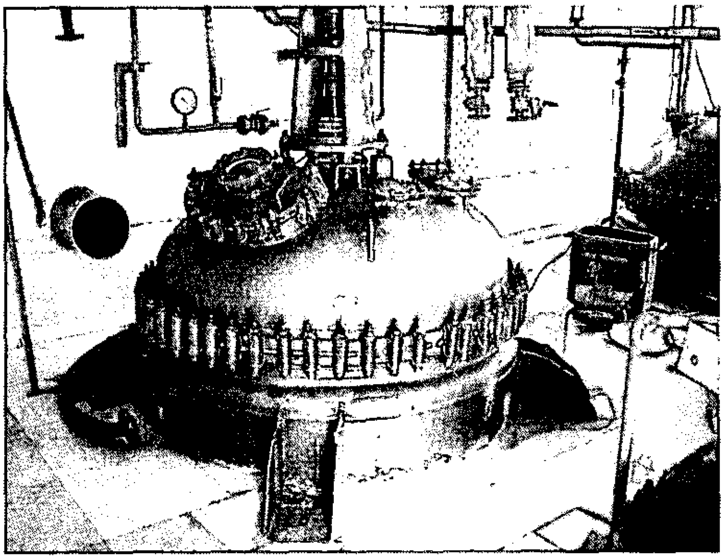




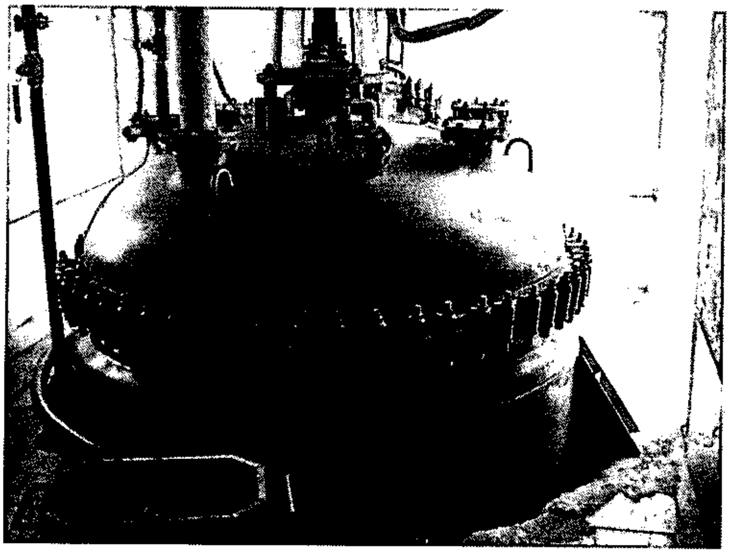
B-1 3,000 liter glass lined reactor with stirrer (Friedel-Craft-Reactor).

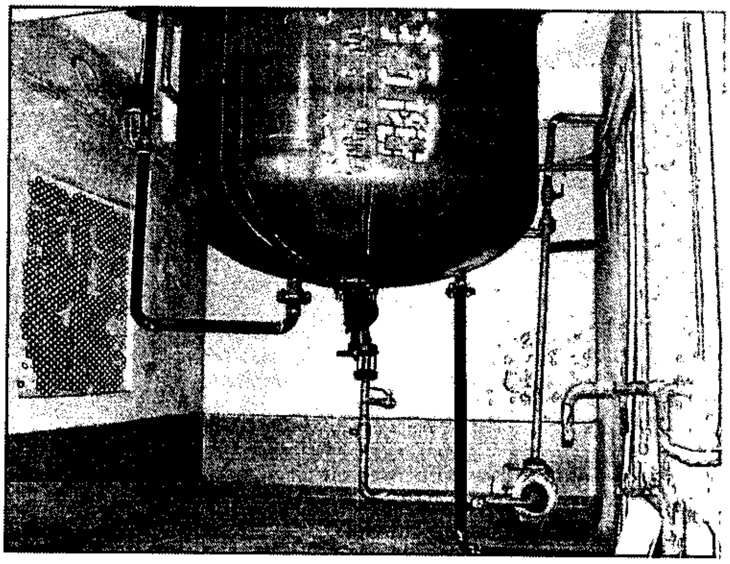




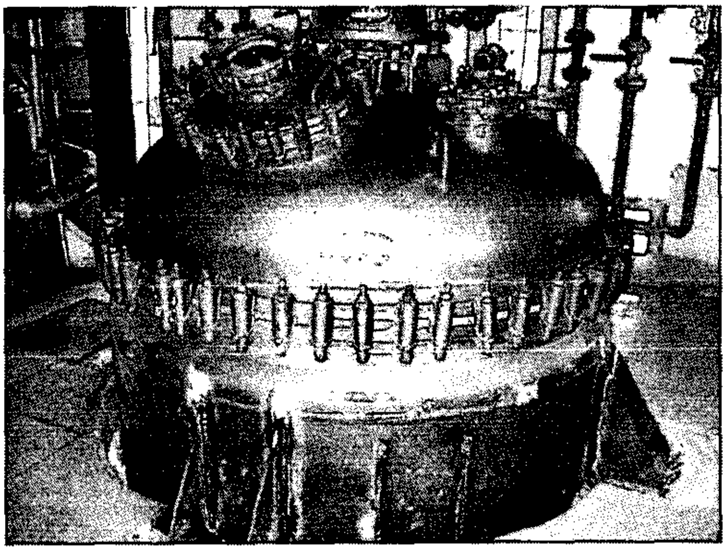


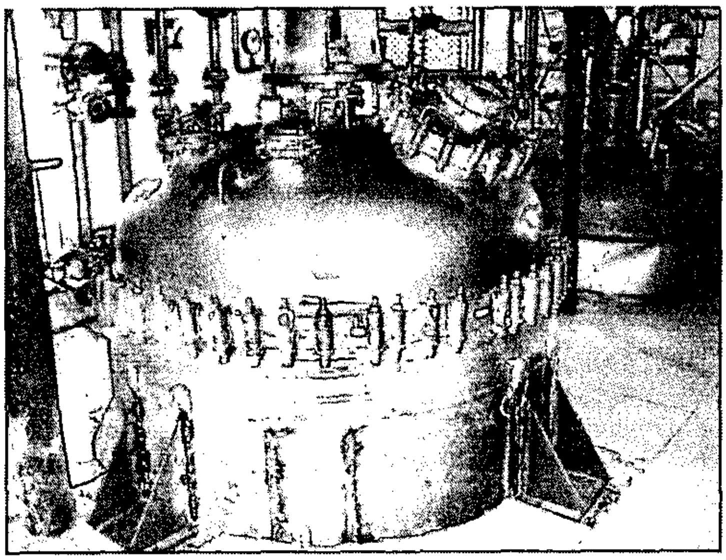
B-2 5,000 liter glass lined reactor with stirrer (quencher/ separator).

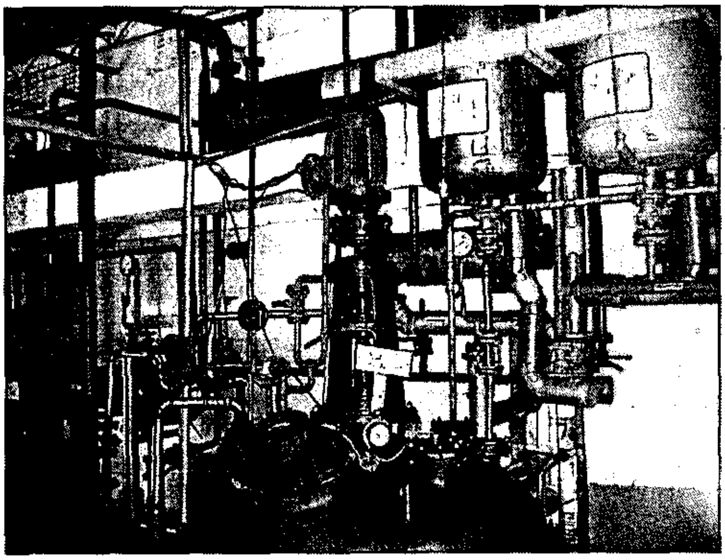




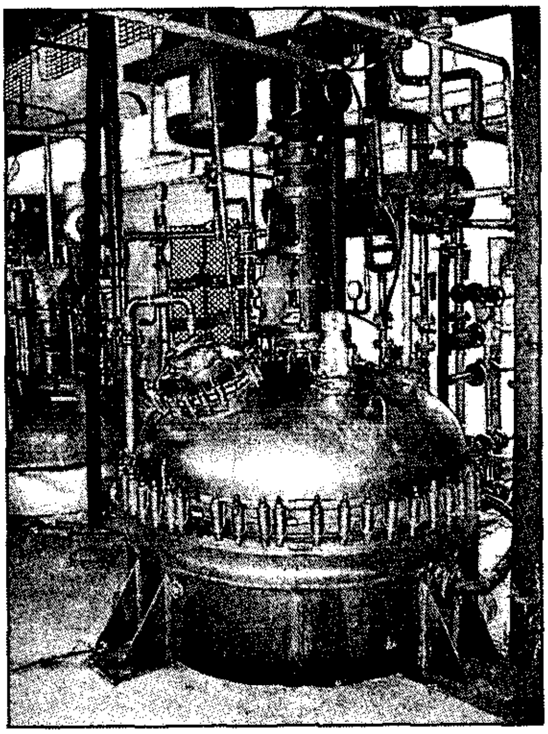
B-3 3,000 liter glass lined holder vessel with stirrer (holder vessel).

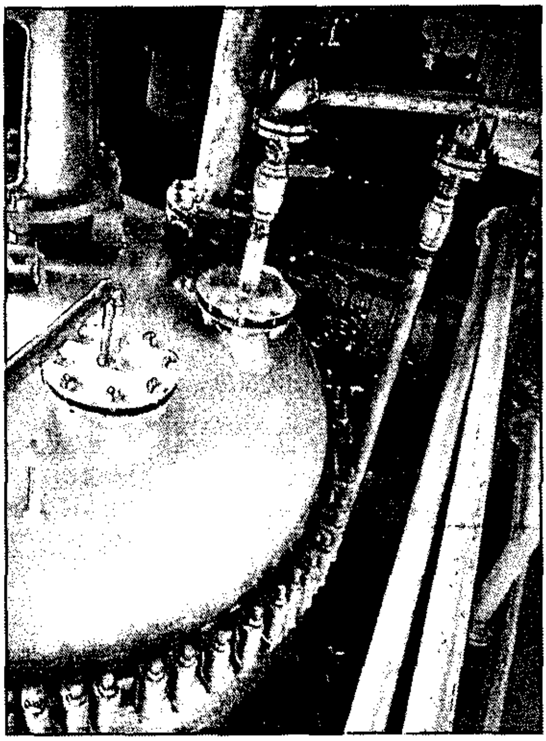




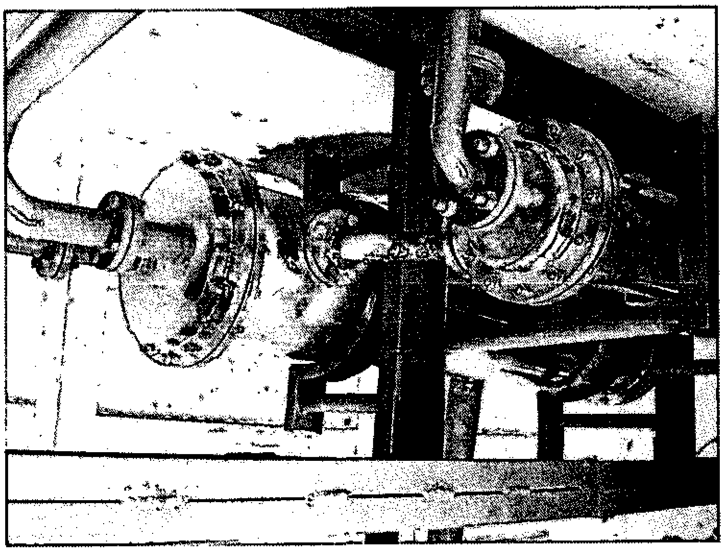


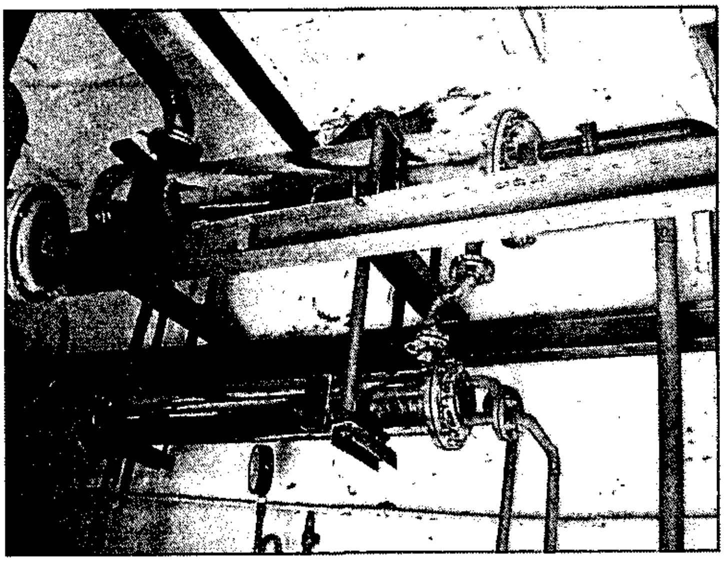
B-4 3,000 liter glass lined reactor with stirrer (neutralization, drying, solvent recovery).

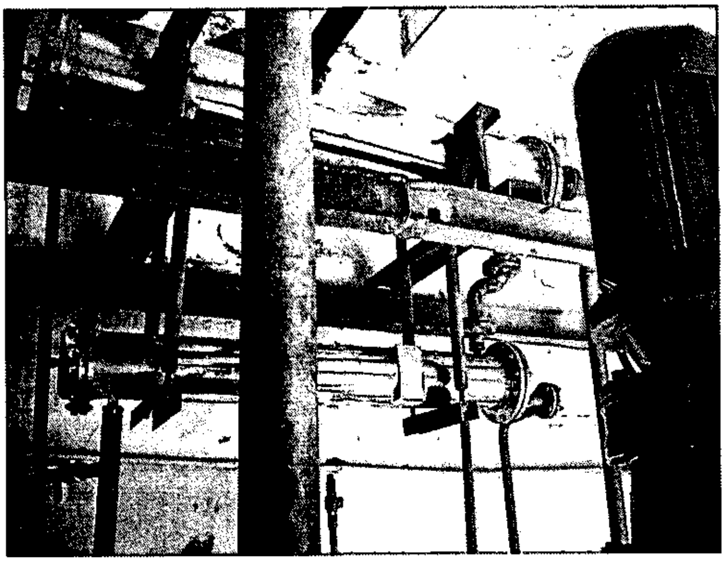




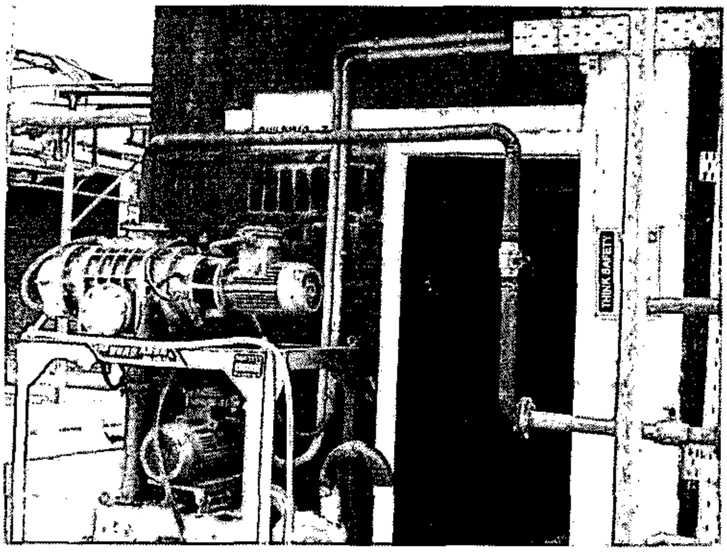
B-5 & B6 Tubler type condenser surface area of 8 & 4 M2 of stainless steel 316.

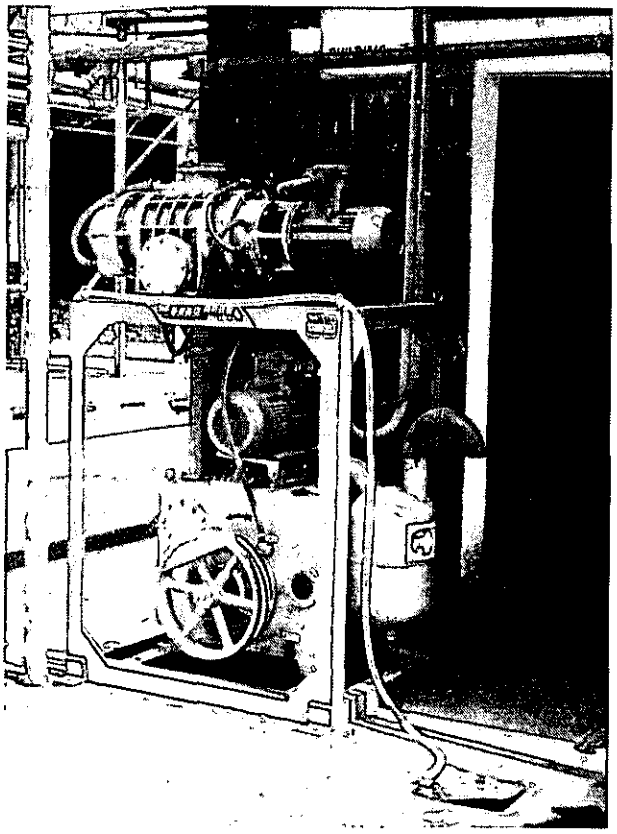




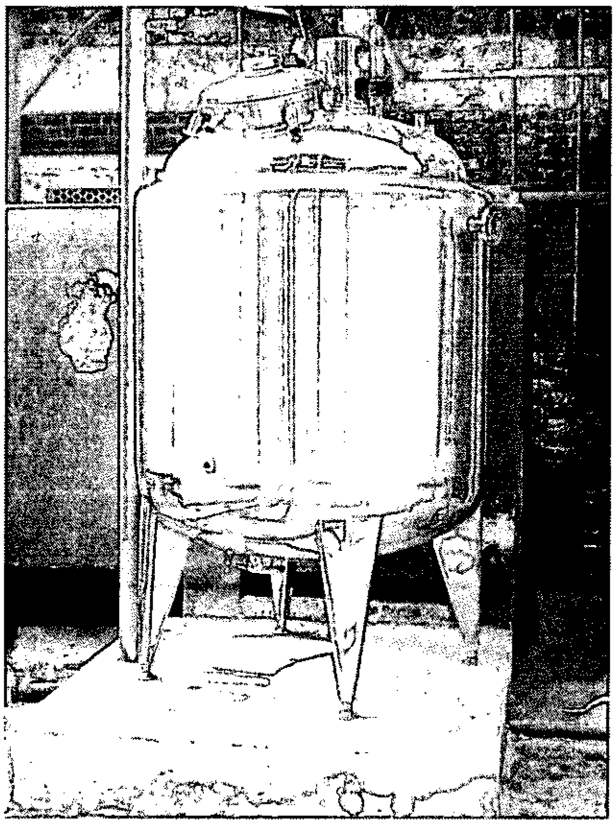


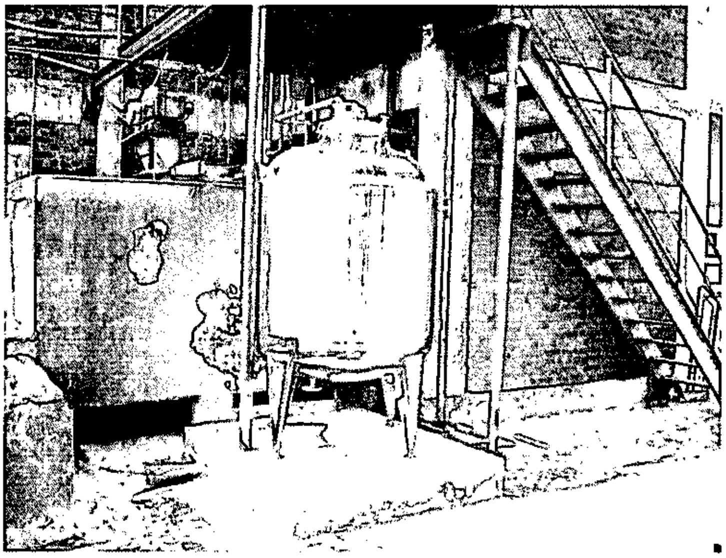
B7 Vacuum pump



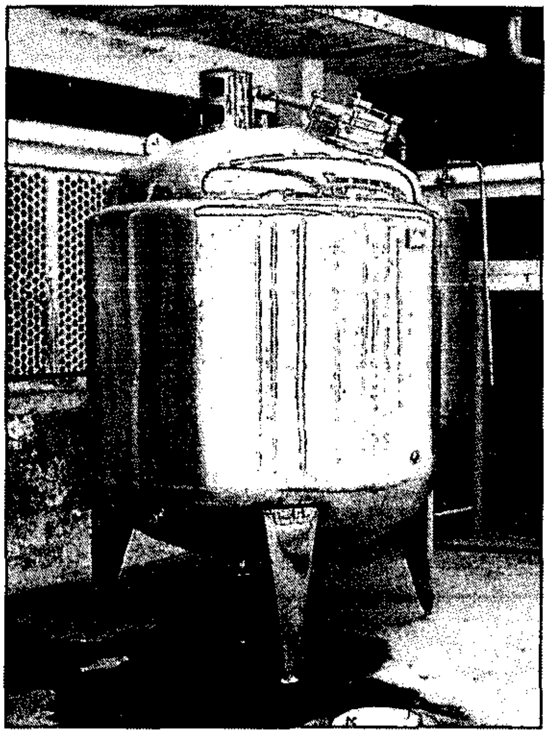


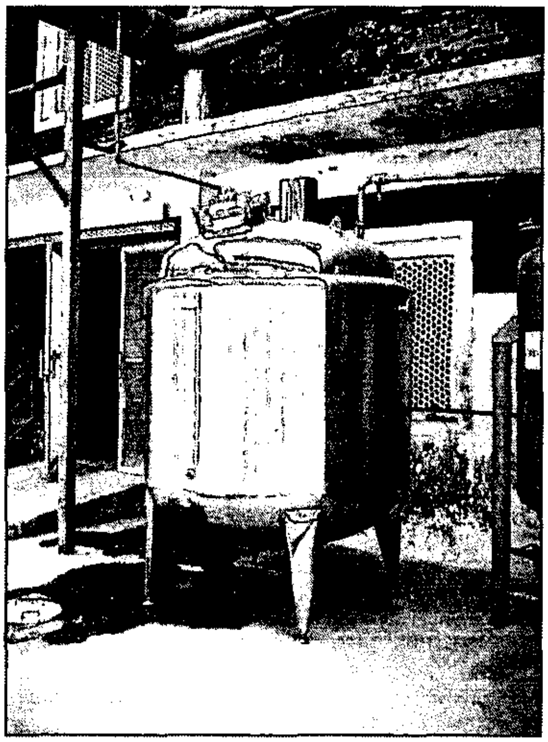
C1 1,000 litre stainless steel distillate receiver (for collection of water/DCE & DCE fractions).



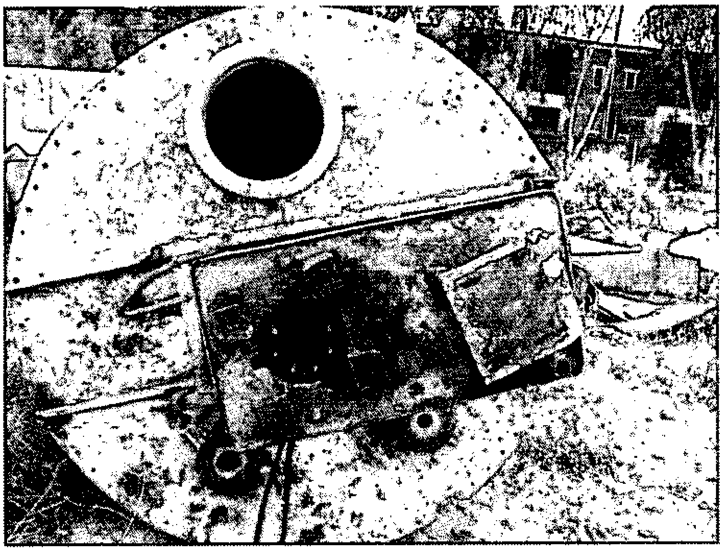


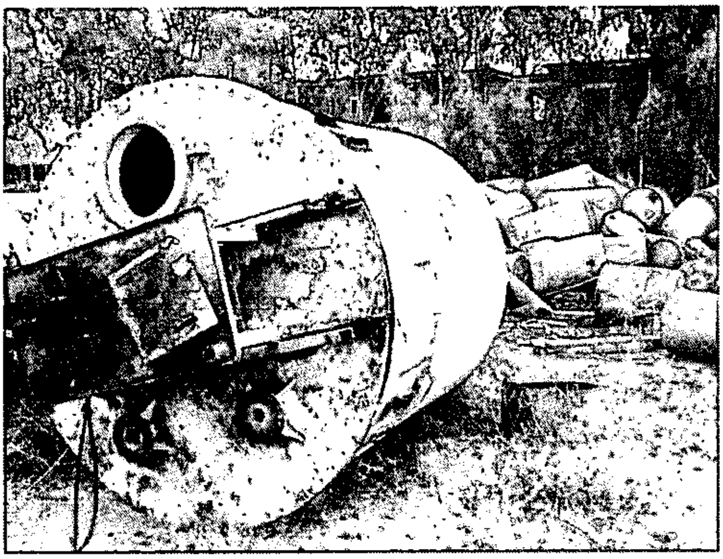
C2 3,000 litre stainless steel distillate receiver (for collection of water/DCE & DCE fractions).



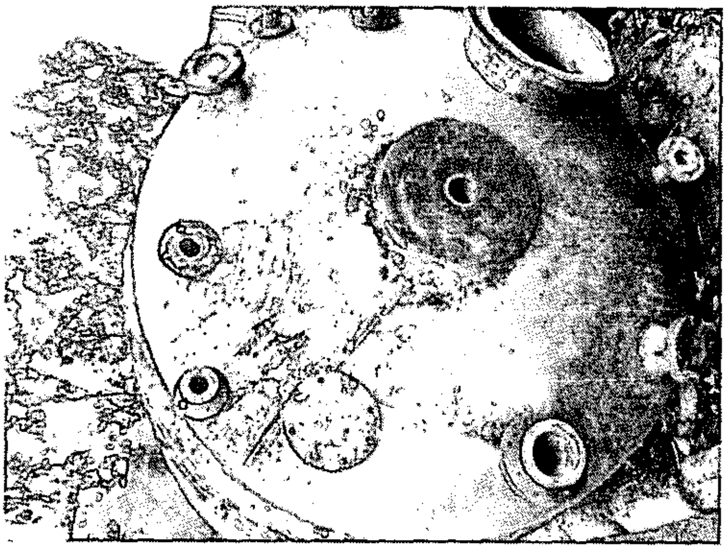


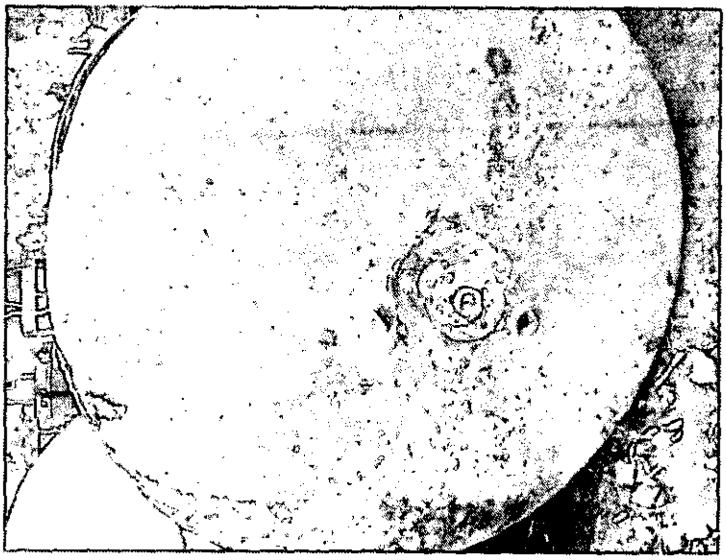
D1 to D9 Dismantling of existing Equipment

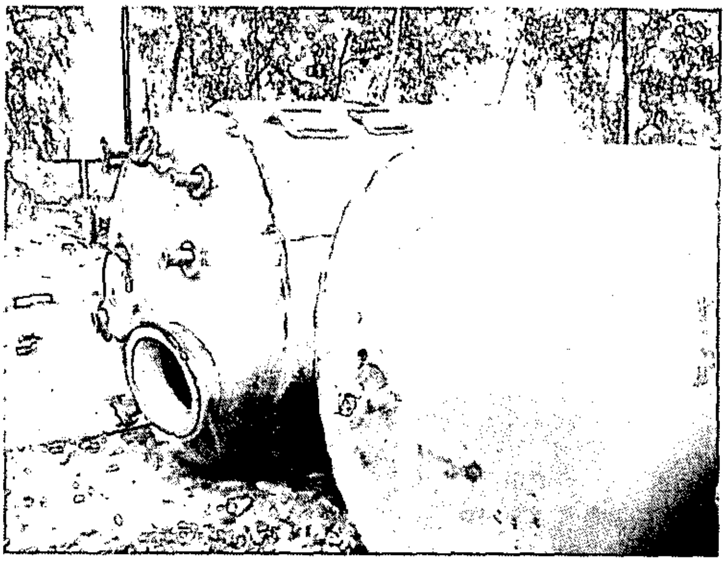




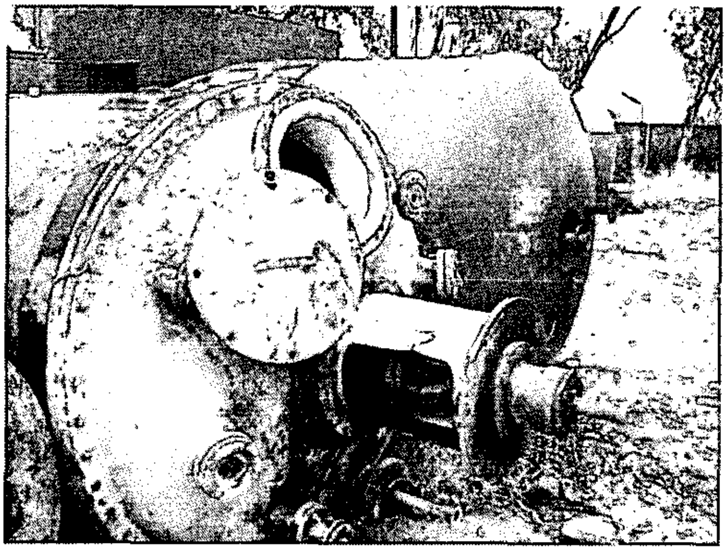
D1 to D9 Dismantling of existing Equipment

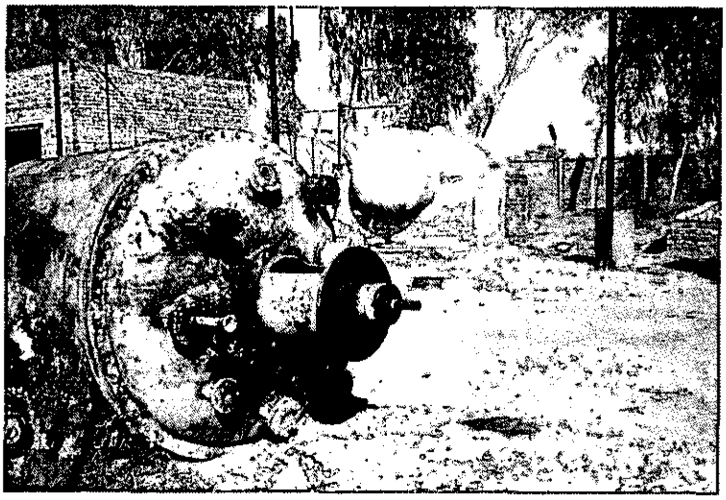


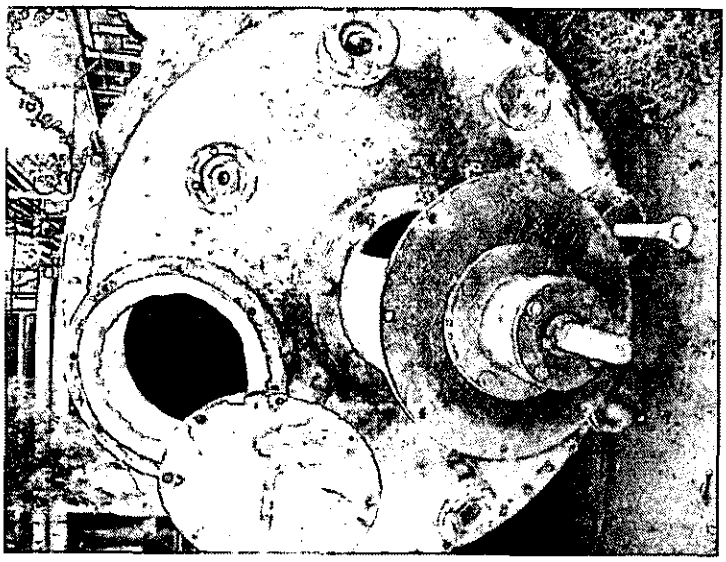




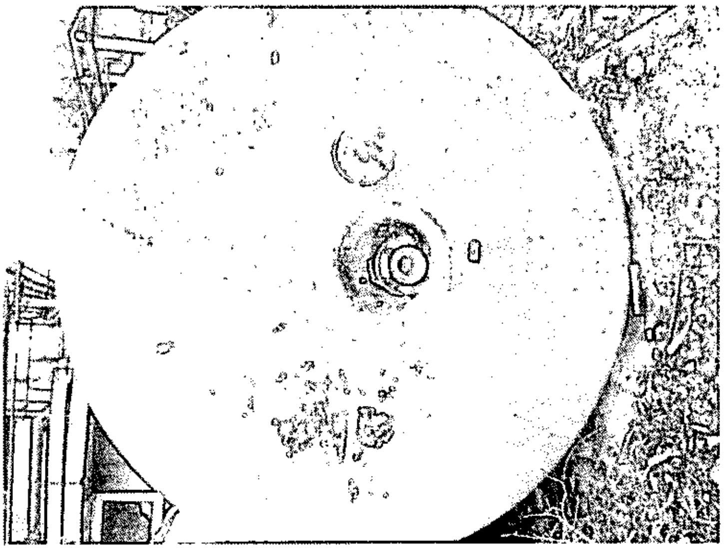
D1 to D9 Dismantling of existing Equipment

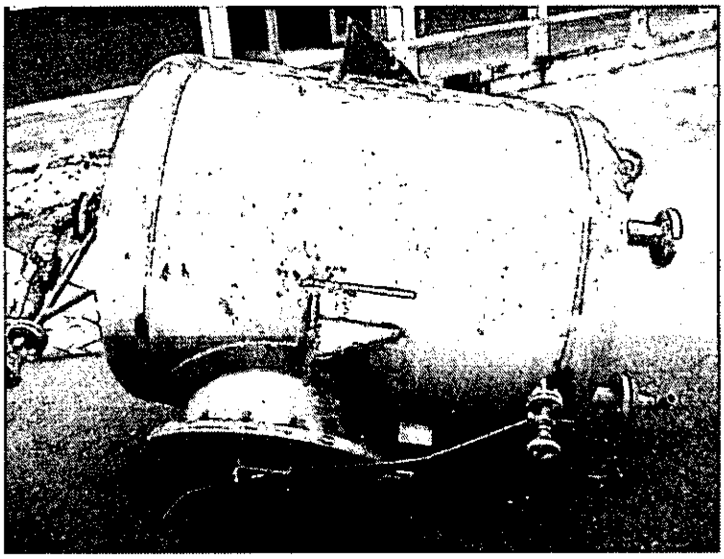




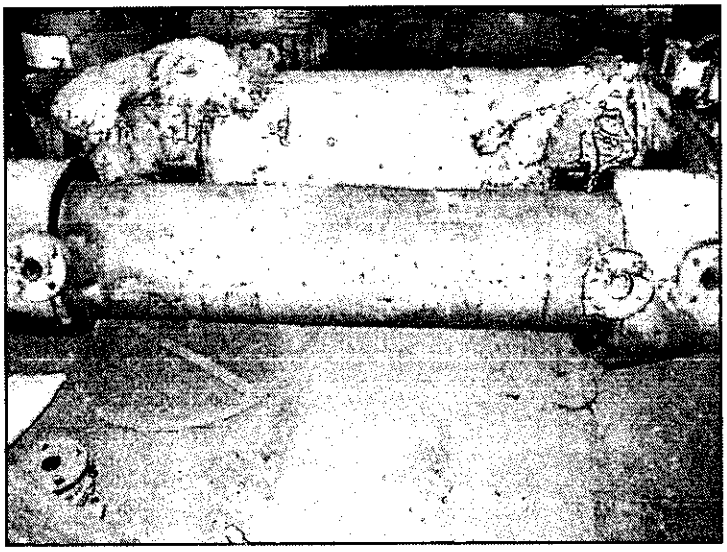


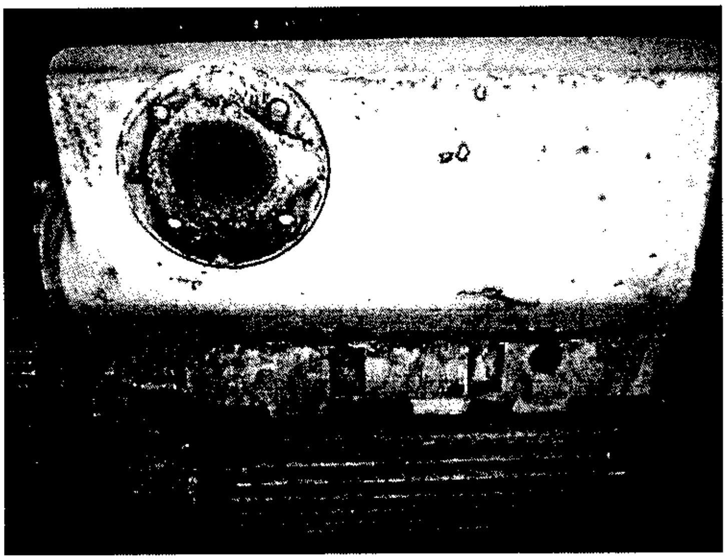
D1 to D9 Dismantling of existing Equipment

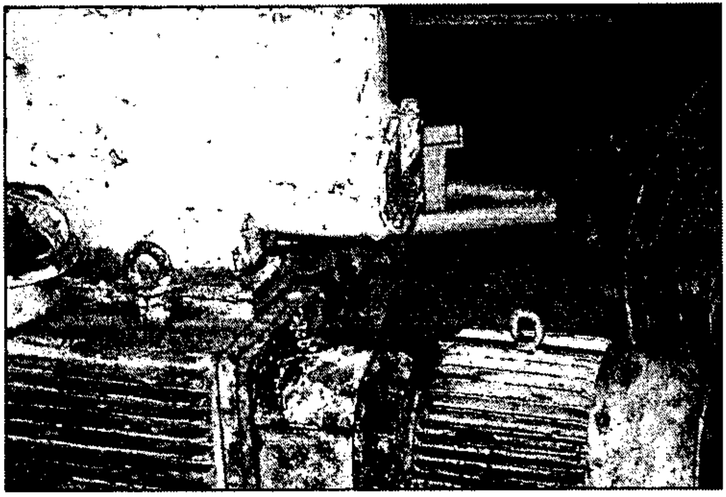




D1 to D9 Dismantling of existing Equipment







ANNEX-4

CERTIFICATE OF THE DESTRUCTION OF ODS BASED PRODUCTION EQUIPMENT

GOVERNMENT OF PAKISTAN
MINISTRY OF ENVIRONMENT
(OZONE CELL)
5th Floor, ENERCON Building, G-5/2, Islamabad
Tel: +92-51-9205884, +92-51-9205412, Fax: +92-51-9205883
Email: ozoncell@comsats.net.pk
****

No. 7(51)/Ozone/2007 Islamabad, the 13th October, 2008

Subject: **CTC Phase Out at Zafa Chemie- Certificate of Destruction of ODS Based Production Equipment.**

Dear Sir,

Reference your letter No. IC/08/826 dated October 08, 2008 on the subject cited above.

2. Two original copies of the certificate of destruction of ODS based Production Equipment duly signed by the undersigned are sent herewith.

3. Please acknowledge receipt.

With best regards

Sincerely yours,

(Muhammad Maqsood Akhtar)
Deputy Programme Manager

Mr **Iqbal P. Sheikh**
Chief Executive
In Consult Private Limited
80 – Aurangzeb Block, New Garden Town,
Lahore
Tel: 042-5869560
Fax: 042 5869561

Cc:
P.A. to J.S. (IC) / NFP for the Montreal Protocol, M/o Environment, Islamabad

CERTIFICATE

of the destruction of ODS-based production equipment

Pursuant to the decisions 19/4, 20/3 and 22/40 of the relevant meetings of the Executive Committee of the Multilateral Fund for the implementation of the Montreal Protocol and the TERMS OF REFERENCE For the conversion of carbon tetrachloride (CTC) as process solvent to 1,2-dichloroethane at Zafa Chemie, Lahore and therein included list of equipment to be destroyed according to the Project Document and also in accordance with the provisions as stipulated in the Project Document concerning the destruction of ODS based equipment, we

CERTIFY

that the equipment related to the use of ODS solvent and namely CTC listed in the table below was destroyed/rendered unusable.

List of equipment rendered unusable		**Disposal implemented**			
Name of equipment	Description	Method of disposal	Date of disposal	Implementer	Certified by
3,000 litre reactor with stirrer.	Capacity: 3000 Model: N.A Serial No.: N.A.	To scrap	May 08, 2008	Zafa Chemie Ministry of Environment, Ozone Cell	Mr. Jawad Amin Khan, Managing Director Mr. Maqsood Akhtar, DPM Ozone Cell
5,000 litre reactor with stirrer (quencher/ separator).	Capacity: 5000 Model: N.A Serial No.: N.A.	To scrap	May 08, 2008	Zafa Chemie Ministry of Environment, Ozone Cell	Mr. Jawad Amin Khan, Managing Director Mr. Maqsood Akhtar, DPM Ozone Cell
3,000 litre holder vessel (holder vessel).	Capacity: 3000 Model: N.A Serial No.: N.A.	To scrap	May 08, 2008	Zafa Chemie Ministry of Environment, Ozone Cell	Mr. Jawad Amin Khan, Managing Director Mr. Maqsood Akhtar, DPM Ozone Cell
3,000 litre reactor with stirrer (neutralisation, drying, solvent recovery).	Capacity: 3000 Model: N.A Serial No.: N.A.	To scrap	February 10, 2007	Zafa Chemie Ministry of Environment, Ozone Cell	Mr. Jawad Amin Khan, Managing Director Mr. Maqsood Akhtar, DPM Ozone Cell

List of equipment rendered unusable		Disposal implemented			
1,000 litre stainless steel distillate receiver	Capacity: 1000 Model: N.A Serial No.: N.A.	To scrap	May 08, 2008	Zafa Chemie Ministry of Environment, Ozone Cell	Mr. Jawad Amin Khan, Managing Director Mr. Maqsood Akhtar, DPM Ozone Cell
3,000 litre stainless steel distillate receiver	Capacity: 3000 Model: N.A Serial No.: N.A.	To scrap	May 08, 2008	Zafa Chemie Ministry of Environment, Ozone Cell	Mr. Jawad Amin Khan, Managing Director Mr. Maqsood Akhtar, DPM Ozone Cell
Condenser surface area of 8 M^2	Capacity: 8 M^2 Model: N.A Serial No.: N.A.	To scrap	May 08, 2008	Zafa Chemie Ministry of Environment, Ozone Cell	Mr. Jawad Amin Khan, Managing Director Mr. Maqsood Akhtar, DPM Ozone Cell
Condenser surface area of 4 M^2	Capacity: 4 M^2 Model: N.A Serial No.: N.A.	To scrap	May 08, 2008	Zafa Chemie Ministry of Environment, Ozone Cell	Mr. Jawad Amin Khan, Managing Director Mr. Maqsood Akhtar, DPM Ozone Cell
Vacuum pump type water ring	Capacity: 700mm of Hg Model: N.A Serial No.: N.A.	To scrap	May 08, 2008	Zafa Chemie Ministry of Environment, Ozone Cell	Mr. Jawad Amin Khan, Managing Director Mr. Maqsood Akhtar, DPM Ozone Cell

In Lahore, September 2008

ZAFA PHARMACEUTICAL LABORATORIES (PVT) LTD
KARACHI

Mr. Jawad Amin Khan,
Managing Director

Mr. Maqsood Akhtar, DPM Ozone Cell
Ministry of Environment

Muhammad Maqsood Akhtar
Deputy Programme Manager
Ozone Cell, Ministry of Environment
Government of Pakistan
Islamabad

ANNEX-5

LETTER FROM M/S. CHEMSALES

Phone : 6349226-27
Fax : 6346761- 6312814
C.C.I. & E. Reg. No. W 096184
N.T.N. : 12-11-0700107
e-mail : zafaph@attglobal.net

Pakistan (Private) Ltd.
L-1/B, Block-22, FEDERAL "B" INDUSTRIAL AREA, KARACHI-75950 (PAKISTAN)

Dated: September 29, 2008

To

Mr. Iqbal Sheikh
In-Consult (Pvt.) Ltd,
80 Aurangzaib Block New Garden Town ,
Lahore,

Subject: **Boiler.**

Dear Sir,

This has reference to our discussions about the O&M Manual of Boiler imported form Metalco Jordan. Your alternate arrangements have worked very well. The boiler has been Installed, Tested and Operated satisfactory.

Kindly arrange to pay the contract fee of Rs. 25,000 (Twenty Five Thousand only) to the MASOOD AHMED KHAN for his services.

Thanking you,

Yours truly,
for Chemsales Pakistan (Pvt.) Limited,

Salahudin Ahmed Siddiqui
Project Manager

ANNEX-6

LETTER OF ZAFA CHEMIE
TO UNIDO HEADQUARTERS

ZAFA CHEMIE
A division of ZAFA Pharmaceutical Laboratories (Private) Limited.
Factory: Raiwind Manga Bypass, Near Sundar Industrial Estate, Mouza Bhaikot, Tehsil & District Lahore. Ph: 5392040.

Dated December 10, 2007

Mr. Milan Demko
Procurement Services Unit
Operational Support Service Branch
United Nations Industrial Development Organization (UNIDO)
Vienna International Centre
P.O. Box 300, A-1400, Vienna,
Austria
Tel: (+43 1) 26026-4837 , Fax: (+43 1) 26026-6815

Dear Mr. Demko

This has reference to your visit to ZAFA Chemie factory on 24th November, 2007 along with representative of Ministry of Environment and UNIDO Consultant M/s. InConsult. As you are aware that ZAFA Chemie have already procured one 3000 liters glass lined reactor as per specifications provided by UNIDO, to check the proposed process on commercial scale and manufactured 15 tons of Ibuprofen.

This procurement by ZAFA Chemie was made from their own funds. It was anticipated that the payment will be made by UNIDO and will be adjusted in contractors invoice as per subsisting Contract No. 16001351 between UNIDO and Chemsales. This decision was conveyed to M/s. Chemsales.

This is for your information and record.

Thanking you

Yours Sincerely.
ZAFA Group of Companies

Mohammad Amin Khan
Chairman

CC: Mr. Iqbal Sheikh – InConsult.

Head Office: L-1/B, Block-22, Federal 'B' Industrial Area, Karachi-75950 (Pakistan).
Ph: 6807100, 6378682, 6346719, 6349226-7 Fax: 6346761-6312814, CABLE: ZAFA CHEM KARACHI. www.zafa.com.pk Email: zafaph@attglobal.net