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FINAL REPORT

Date : 30th July.1994

UNIDO Ref : DP/VIE/86/O16

Contract No 92/192P

The Contract No 92/192P between UNIDO and the Design Institute of Chemical Industry (DICI) concerning DICI's "provision of engineering, equipment inspection, erection supervision and operating manual for the construction of the Pilot Plant under Project DP/VIE/86/O16 signed on 16/12/1992. As soon as its signature, the works identified in the Contract have been promptly and carefully executed by DICI.

I. DESIGN

1. Basing on the engineering flow sketches by Mr. Fryda which are included in the Report No3 dated 20/11/1993 and second opinion and recommendations of Mr. Strenger, the flowsheets for the production lines of the Pilot Plant were established. These flowsheets have been subject to several extensive discussion with NDP and experts from project VIE/86/016. These flowsheets, taking account of the comments by the people concerned had been added, modified and finally completed on 10/1/1993. In view of the literature and requirements by Mr. Fryda and Strenger, equipment layout drawings of the main production lines and utilisers have been finalized. so as piping layout. All these drawings were presented to the NPD and the concerned experts of the project. It appears that some modifications against Mr. Fryda's proposal in equipment and piping

layouts were made in response to the project requirements. All these documents were properly completed by the end of Jan. 1993.

2. The mechanical equipment drawings by Bason Shipyard have been relevantly and carefully checked, one unit by one, each with a checking certificate in which the faults in the drawings and instructions on remedy have been indicated. The safety of the pressure equipment units have been sufficiently calculated.

Recalculation and redesign for items No O.17; O.17a; O1.11 have been carried out as the original design was out of discipline. Calculation and design for item O1.12 which has been newly put in as proposed by Mr. Strenger has been already done by us. All the "checking certificates" and new design drawings of items O1.7; O1.7a; O1.11 and O1.12 were handed over Bason Shipyard on 8/1/1993 and all the faults on drawings were pointed out by engineers from DICl and were given assistance and comments to properly remedy.

From 13/2/1993 all the drawings which had been completed by engineers from Bason Shipyard in account of comments and suggestions of engineers from DICl, have been checked again. An equipment unit is manufactured only when its drawings have been approved by us and the manufacture is carried out as soon as the drawings have been approved to ensure the progress of the project in timely manner.

3. The lighting system and electric system in service of production were completely designed in accordance with technical standards and production requirements with particular attention being put on anti-explosion and anti-fire rooms. So, by 17.3.1993 all the documents required in the Contract were completed in timely manner together with added design of some new items. On 26/3/1993 comments by Mr. Scedrov on the above-mentioned drawings was received and a reply was faxed on 2/4/1993.

II. EQUIPMENT MANUFACTURE

DICl's identified duty is to supervise, check and approve the equipment manufacture by Bason Shipyard for which 2 engineers of DICl were appointed to constantly supervise and check.

However, the manufacture appeared to be delayed for several reasons.

Other equipment units supplied by Bason Shipyard have also been checked and approved by DICl.

In general, the equipment manufactured by Bason Shipyard have so far met the design requirements. The safety inspectors from labour department of HCM city asked to remove some items of steam generator (O6-6) in order to improve the working environment of the steam generator. The work was completed on

15/1/1994 - The "inspection certificate" of steam generator was given and it worked normally.

III. ERECTION

These seemed to be a great delay in civil works for several reasons (However not by DICI) which has been strongly resulting in the slow progress of the project. Active assistance/ instructions and supervision by engineers from DICI were given to Bason persons on the erection of equipment, steel structure manufactured by them. The piping erection was carried out in the same way. These were also several difficulties in implementation of subcontract for imported equipment due to the absence of their technical required. On 7/1993 DICI was assigned by UNIDO to do the erection for these equipment which suffered a lot of obstacles the above-mentioned reasons. Some supplemented items were to be manufactured by us. Thanks to the active efforts, the proper erection was completed by 27/7/1993. In early 1994 Water demineralization was installed and put in to test-run. The quality was as good as required. The erection of instrumentation has also experienced lacking of installation instructions and the failure of supply of 6 items by Honeywell - DICI was agreed by UNIDO to supply these 6 items. On 26/10/1993 DICI was approved by UNIDO on the erection of instrumentation which has been sufficiently completed.

The erection of all equipment has been, so far, finished and experienced checking and test-run.

During erection and test-run we were given recommendations or requirements of modification by Mr. Strenger and Scedrov when they were on mission under the project in order to optimize the engineering flowsheets.

IV OPERATING MANUAL We have completed 37 operating manuals of which 35 manuals were checked by Mr P.E. Strenger and CTA - Scedrov. These manuals were modified and republished referring to recommendation of CTA. Process control instrumentation was translated in to Vietnamese for use, because we have got detailed operating manuals from Honeywell (enclosed list of Operating manuals).

V. START UP/COMMISSIONING OF THE PLANT

Due to plenty of reasons, the start up/ commissioning hasn't been finalized by project VIE/86/O16. In light of the agreement concluded in the TPR held in mid December/1992. The start up and Commissioning for 3 main production lines are to be carried out no later than 31/12/1993. By 8/1/94 the start up and Commissioning for 2 out of the 3 production lines namely chymotrypsin and dry bile were carried out. The start up of pancreatin production line was stated to realize by 7/1/1994 and later expected on 10/1/1994. Until the draft final

report is written, the pancreatin production line hasn't been started-up/ commissioned.

According to the contract, the civil works of the pilot plant are to be completed within 12 weeks but in fact we've worked for the project for more than one year. During this period we have tried our best efforts to properly undertake the works identified in the contract in terms of quality and timely manner.

Nevertheless our works are much related to the works of other sub-contractors leading to the impossibility of our initiative and active role unless their works have been finalized .

- From march to june 1994 with the help of the experts from project VIE/86/O16 and the technological guidance of CTA we executed test-run of pancreatin batches and dry bile. Finally the product was obtained and Acetone solution was recovered.

- In this period test-run of the utility equipment was carried-out with good performance. After Cation and Anion were regenerated by H₂SO₄ and NaOH, water demineration unit (item O9.2) provided water as good as required. The steam generation was tested (item O6.6) and delivered steam pressure 3,5 kg/cm² to the consumptive site in safety.

- Test-run of Acetone rectification column (item O2.1) was carried out and its performance was checked.

+ Feed Acetone solution recovered from Pancreatin production in to the column.

+ Discharge the waste of the column.

+ Supply steam for continuous rectification . The temperature of the operating process was regulated by the UNIDO experts.

- Due to the economic reality we have made test-run of water distillation unit (item O9.1) and rotary evaporator (item O4.2) without starting up of cooling water unit (item O5.3). Recently we have put together the above mentioned equipment in operation and at the same time supplied cooling water. In result their capacity increased and reached the designed capacity.

- After success of test-run of the equipment in the production lines of project VIE 86/ O16 the commissioning certificate of the Pilot-Plant was signed by UNIPHA, DICI and BASON in late June 1994.

- After 18 months spent by DICI on design, inspection of equipment design, equipment manufacture and erection inspection, imported equipment installation all the production lines of Pilot-Plant VIE /86/O16 have been completed. The quality

of the product was as good as expected, and the Pilot-Plant was in good operation. However we always look after its operation to maintain good production.

During working we have always relevantly cooperated and discussed with CTA and UNIDO experts when they are available as well as NDP, project experts and persons concerned of other sub-contractors in efforts of good construction of the pilot plant in accordance with requirements and favorable to the project. It's inevitable that some minor mistakes could be made by our engineers during working but they were timely remedied and put in order right at the site and certainly didn't affect the quality and progress of the project.

Payment UNIDO in Vienna is kindly requested to make the payment of the money mentioned in the contract and the rest of money for imported equipment and instrumentation installation that has been carried-out in reference to the quotation.



Do Duy Phi

Project manager.