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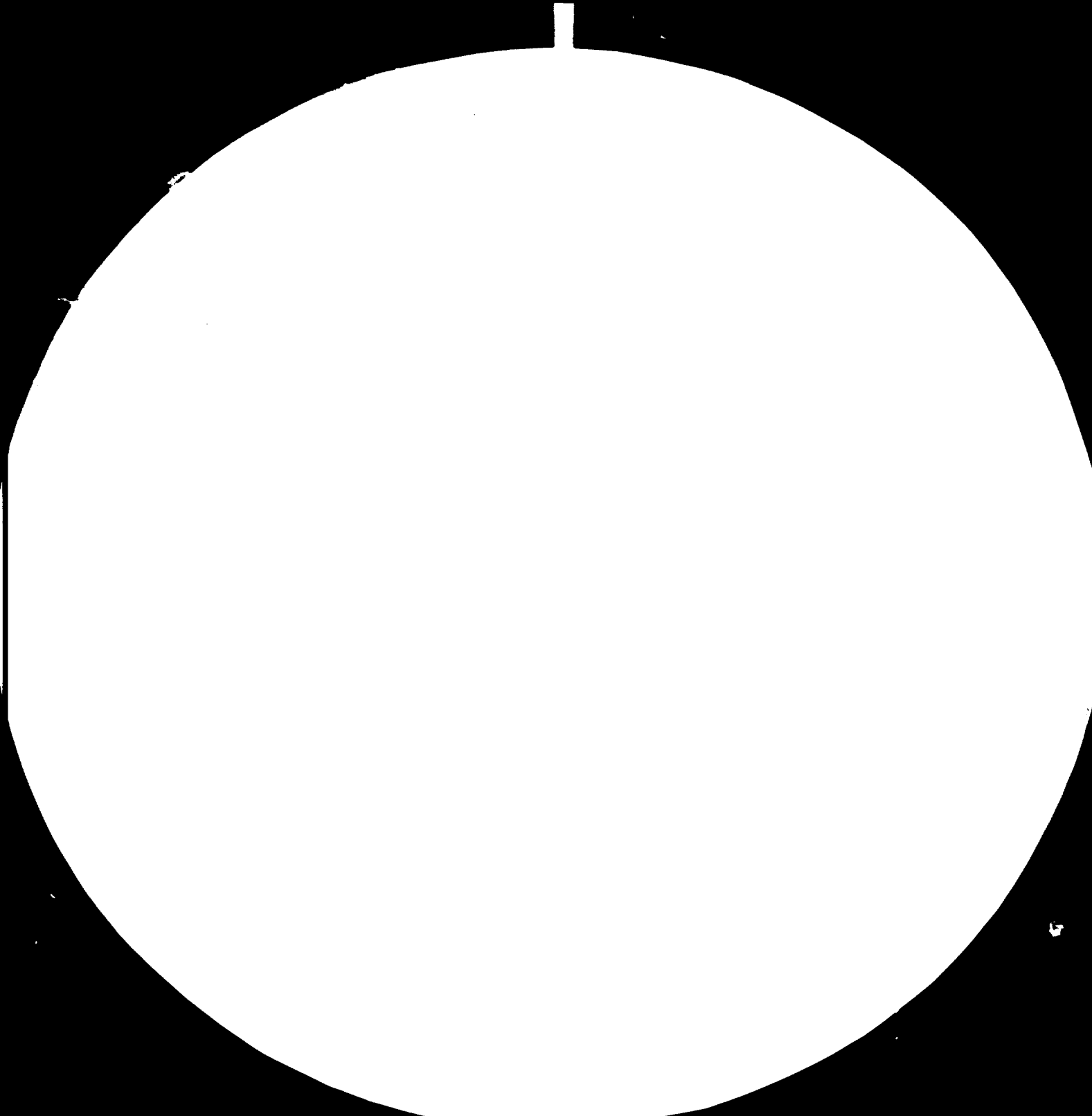
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UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

APPRAISAL BY ISLAMIC DEVELOPMENT BANK
ON POSSIBLE PARTICIPATION IN FINANCING
OF SODA ASH PRODUCTION IN BANGLADESH

TF/BGD/82/001

BANGLADESH

Technical Report : Soda Ash Production in Bangladesh*

Prepared for the Islamic Development Bank
by the United Nations Industrial Development Organization

Based on the work of B.D. Bohna,
Consulting Engineer

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INTRODUCTION

Under an agreement between the United Nations Development Organization (UNIDO) and the Islamic Development Bank (IDB), UNIDO provided the services of an expert to join an IDB appraisal mission in reviewing the application of the Government of Bangladesh and the Bangladesh private sector for assistance in financing the construction of a 330 metric ton per day sod. ash plant oriented to the domestic market.

The UNIDO expert, Mr. B.D. Bohna, from the US, joined two staff specialists from the IDB, Mr. Nasimuddin Siddiqui and Mr. Musa Musaffar Gul in Bangladesh on September 3, 1982. This IDB appraisal team then spent seven days in Bangladesh reviewing the proposed Soda Ash Project and another proposed project for the production of methanol. A separate report has been prepared covering the Methanol Project. Under the terms of reference and in view of the limited time available, priority was given to evaluation of the Methanol Project. However, sufficient work was done on the Soda Ash Project to confirm to the IDB that the project as proposed is worthy of further study by the sponsors and by the IDB.

This report prepared by the expert provides suggestions on subsequent work to be done by the sponsors in proving the economic viability of the project.

CURRENT STATUS OF THE PROJECT

The current status of the project is described as follows by the sponsors of the project in their Preliminary Feasibility Report of January, 1982.

QUOTE:

"1. Institutional Set Up

A new company, called Basic Chemicals Limited (BCL) will be established as a public Limited Company incorporated under the companies Act of 1913. The majority share holders will be private sponsors and the minority shareholders will be the Bangladesh Chemical Industries Corporation. The pattern of shareholding is given in Sec. 8. The Company will not have less than five and not more than seven directors including a Chairman of the Board of Directors. The Bangladesh Chemical Industries Corporation (BCIC), the minority shareholders, will be adequately represented in the Board of Directors and will have necessary influence in policy formulation and other aspects of Company management. The proposed Company will act as the Executing Agency solely for implementation and operation of the plant.

2. Management and Staff

The Board of Directors of BCL shall be the policy making body and shall be responsible for achieving the objective for which the BCL is to be established. The Managing Director shall be the chief executive of the company and shall be responsible for conducting the day-to-day business of the company. BCL will have about 1075 employees by the time it reaches the stage of commercial operation. Modern chemical plants are highly integrated and complex

requiring skilled manpower. BCL plans to appoint technical and managerial staff from the different industries existing in the country for successful implementation of the plant. In order to strengthen the management and staff of BCL, particularly in the technical field, BCL will -

- (i) Engage a foreign Technical Consulting Firm to assist BCL in monitoring and supervising implementation, construction and commissioning of the project;
- (ii) Appoint a team of Management Advisors to assist BCL in the initial management and organization of operations of the plant; and
- (iii) Undertake a comprehensive technical training program for the technical staff to be arranged by the General Contractor in the plant of Process Licensors as well as in suitable institutes.

3. Bangladesh Chemical Industries Corporation (BCIC)

BCIC is a statutory autonomous Corporation - established in July 1976 under the Bangladesh Industrial Enterprises (Nationalization) Order of 1972. BCIC was formed by the merger of Bangladesh Fertilizer, Chemical and Pharmaceutical Corporation (BFPC), Bangladesh Paper and Board Corporation (BPBC) and Bangladesh Tanneries Corporation (BTC). The main functions of BCIC are to control, supervise and coordinate the activities, business and affairs of 34 nationalized industrial enterprises. BCIC acts as a holding company and its income is derived from overhead charges that it charges to its subsidiary enterprises for the provision of supervisory services. The general authority to direct and administer the affairs and business of BCIC is vested in Board of Directors appointed by the Government which has overall superintendence and control of the Board. The Board consists of a Chairman, who is the Chief

Executive of BCIC, and five Directors. Each Board member, including the Chairman, is an operating director for a group of enterprises as well as a staff director for major corporate functions such as finance, planning, commercial, engineering and production.

4. The Sponsors

The private sponsors are at present associated with two other chemical processing industries. In addition, there are some sponsors who are experienced in business and industry and also have other professional backgrounds.

Of the two projects in which the sponsors are associated, one plant, costing \$6 million, will be in production in January 1982 manufacturing 6000 MTPY of Starch and 1800 MTPY of Dextrose. The other plant, costing \$10 million, will be producing 11000 MTPY of liquid sugar from molasses, and is expected to be in production in June 1982. Other activities of this group of sponsors consist of a construction firm, trading, indenting and consulting, advertising and publicity, and a bonded warehouse.

5. Present Status of the Project

The proposed company initially approached the Director General, Department of Industries for permission to apply to a local financial institution (The Bangladesh Shilpa Bank) for processing the project and the approval has been communicated on June 19, 1981.

The sponsors also discussed with the Bangladesh Chemical Industries

Corporation their participation in the project. After their initial agreement, a formal request was made to them and BCIC subsequently informed the sponsors of their intention to participate in the project.

The sponsors also held discussion with various international financial organizations. They were interested in the project, but requested a feasibility study and a forwarding note by the Ministry of Industries and the External Resources Division of the Ministry of Finance. These are now being processed."

END OF QUOTE

REFERENCE MATERIALS PROVIDED

The IDB appraisal team was provided with copies of the following preliminary studies:

Report - Basic Chemical Industries in Bangladesh
Fertilizer (Planning and Development) India - 1978

Report - Manufacture of Soda Ash in Bangladesh
Fertilizer (Planning and Development) India - 1978

Feasibility Report - Soda Ash Manufacture in Bangladesh
Associated Technical Services Ltd. Dacca - 1982

The Feasibility Report had been submitted to the IDB in February 1982. Copies of various copies of correspondence pertinent to this submittal were available in the IDB files but were not inspected by the UNIDO expert due to time limitations.

ASSISTANCE TO APPRAISAL TEAM

The IDB appraisal team was greatly assisted while in Bangladesh by arrangements made by the External Resources Division of the Ministry of Finance of the Government of Bangladesh. The following Government officials were especially helpful:

Dr. Muhuiddin Alangir - Joint Secretary (Also Executive Director
IDB)

Dr. Aminul Huq

Mr. M.A. Malek - Senior Section Officer

Useful information was also provided by staff of the Government owned Chittagong Urea Fertilizer Limited which is starting work on a large urea plant in the Chittagong port area. The IDB is participating in the financing of

this project under a leasing arrangement for the on-site power plant.

Mr. Ejaz R. Chaudhury - Project Director (Dacca)

Mr. F.H. Chaudhury - Chief Engineer (Dacca)

Mr. M.D. Kamal Uddin - Assistant Civil Engineer (Chittagong)

Mr. A.S.M. Shah Alam - Assistant Civil Engineer (Chittagong)

Very valuable information on general engineering and construction practices in Bangladesh was provided by:

Mr. Forhad Hossain - Building Design Center Limited
Director - Consulting Civil Engineer

The Building Design Center, specializing in civil and structural engineering provided engineering and design services for all of the site work and buildings on the two chemical plants already built by Rahman Chemicals Limited.

The basic presentation by the private local sector sponsor of the project, Rahman Chemicals Limited, was made by the principals of this firm.

Syed Khaldedur Rahman - Principal, Administrative Manager

Syed Shonudur Rahman - Principal, Technical Manager

Murza Najmul Huda - Director, Manager Starch Plant

FIELD INSPECTIONS

Mr. Bonna of the IDB appraisal team visited the Starch-Glucose-Dextrose plant built by Rahman Chemicals and recently put into production on September 2. This plant is located in Tarado, a suburb of Dacca about 11 miles from Moshul.

It was financed and built after basic feasibility studies had been done by the Rahman Chemicals principals. The plant cost \$6,000,000 and employs 160 people working four shifts. During Mr. Bohna's visit the starch production line was shut down to permit testing and startup of the glucose and dextrose sections. Danish engineers employed in the startup were interviewed and confirmed the trouble free startup and operation of the starch section some four months earlier.

The basic process and equipment for the starch plant were supplied by Alfa Laval (Swedish). The process and equipment for the dextrose and glucose section were supplied by DDS Kroyer (Danish). Erection was done by a local contractor under expatriate supervision. Civil and structural design of site, buildings, foundations, etc, was done by a local consultant, Building Design Center Limited. The plant takes process water from a 400 foot tube well on the site. Power is generated by two 450 kw Caterpillar Diesel Electric Generating Sets (1 standby). Steam is provided by a 6000 pound per hour U.S. made package boiler. Plant layout and detailing is excellent. The plant, although not heavily instrumented since it is a batch process, is equipped with Foxboro instruments. All process equipment and piping is stainless steel and the onsite welding of the same is reported to have been done by specially trained local welders. (Photographs of the plant are available)

Several of Rahman Chemicals staff including Syed Shohudur Rahman (principal) and Murza Najmul Huda (plant manager) were sent to Europe for training by the equipment suppliers during plant construction.

The quality of this grass roots effort by the Rahman group utilizing a maximum of local technical talent and labor speaks eloquently for their technical, financial, and management ability. Presumably, the completion and startup of their \$13,000,000 liquid sugar plant later this year will further confirm this impression.

COMMENTS

1. General

The project can be considered to be in the very early study stage as far as an application for financing to the IDB is concerned. Substantial additional work with outside technical assistance will have to be done before analysis of financial viability in a form acceptable to the bank or other financial institutions can be prepared

The project, primarily because of its size, represents a quantum jump in the activities of the sponsoring group. It would be easy to suggest at this early stage that the undertaking is too large and sophisticated for the organization and manpower available in Bangladesh.

However the project is important within the overall framework of industrial development within the country. Other projects of similar complexity and size have been built and put into operation. Even now a \$500 million urea plant is ready to go to bid.

Since the principal Sponsor, Rahman Chemicals Ltd, is already in the chemical processing industry on a small scale with a \$6,000,000 Starch, Glucose, and Dextrose Plant in operation, and a \$13,000,000 plant for production of liquid sugar from molasses under construction, their ability to carry this much larger project through to successful completion, with suitable outside assistance cannot be completely discounted.

2. Plant Process

The Basic Chemical Industries Report (1978) recommends the Dual Process utilizing ammonia and salt as feedstock and producing soda ash and ammonia chloride. This recommendation was based upon a minimum viable capacity 200 TPD plant. The Basic Chemicals Limited Feasibility Report (1982) is based upon a 330 TPD plant utilizing the Dual Process.

Basic Chemicals Limited Feasibility Report (1982) appears to be based primarily upon data supplied by Central Glass Co. and their licensee Toyo Engineering Corp.

Time allowed for the present IDB appraisal did not allow any review or updating of the original recommendations on process.

3. Raw Materials

Assuming the Dual Process is used the required raw materials per tonne of dense soda ash produced are, according to the Basic Chemicals Limited Report (1982):

Salt (As 100% NaCl)	<u>Tonne</u> 1.16
Liquid Ammonia (As 100% NH ³ by weight)	0.325
Carbon Dioxide (As 99% CO ₂ by volume)	0.280

For the proposed production of 330 TPD with annual production rated at 100,000 TPY, feedstock requirements are:

	<u>TPD</u>	<u>TPY</u>
Salt	382	116,000
Liquid Ammonia	107	32,400
Carbon Dioxide	93	28,000

These figures are of the general order of magnitude but should be confirmed against actual requirements for the process selected.

a) Salt

The present production of sea salt in Bangladesh is approximately 700,000 TPY. In addition 35,000-50,000 tonnes is imported in poor production years. Thus the raw material requirement of 116,000 TPY for the proposed plant represents a sizeable increment to the present domestic production. The local cottage industry is also reported to be relatively inefficient and to suffer somewhat from lack of quality control.

Thus the source of salt for the plant needs careful detailed study to ensure a continuous supply of the required quality.

b) Ammonia

Ammonia is produced from natural gas and Bangladesh has adequate supplies of natural gas for this purpose. A new pipeline is under construction which will deliver natural gas from the Bakhrabad field to Chittagong and/or intermediate points.

The Basic Chemical Industries Report (1978) goes into some detail (Chapter 5) on the desirability of obtaining the ammonia required for the production of soda ash by the Dual Process from one of the existing or planned urea plants. The primary advantage of this would be the economics of production cost in say a 1000 TPD plant vs a 150 TPD captive ammonia plant. The differential cost of production is estimated as \$150/tonne.

The Basic Chemicals Limited Feasibility Report (1982) assumes a 150 TPD captive plant located 20 km. northeast of Chittagong Port. The selection of this site presumes that no arrangement is possible for purchase

of ammonia from one of the new urea plants in the immediate Chittagong area. Taking the figure of \$150 per ton for the incremental cost of production of ammonia in a sub-optimal sized plant the ostensible extra production cost is $0.325 \times 330 \times 150 = \$16,087/\text{Day}$ or \$5,872,000 per year.

Certainly the possibility of Chittagong Urea Fertilizer Ltd. increasing the size of its ammonia plant by 150 TPD and selling to the Basic Chemicals Limited Soda Ash Plant on an adjacent site needs to be fully investigated. Even if for other valid reasons the Soda Ash Plant were located 20 kilometers northeast as currently planned, it would be much more economic to pipe the ammonia from the larger plant rather than build a small captive plant.

The guidance of the Bangladesh Government, presumably through Bangladesh Chemical Industries Corporation (BCIC) which would be involved with both Chittagong Urea Fertilizer Inc. and with Basic Chemicals Limited would appear to be needed.

Note that as described under Item 6 similar overall planning by the Government is obviously required in connection with all new plant site locations and developments in the Chittagong Port Area.

c) Carbon Dioxide

Carbon Dioxide is produced in the process of manufacture of ammonia. It is used in urea production where urea is the end product.

However an ammonia-urea plant complex may operate on the basis of a close balance in carbon dioxide supply.

It is not clear therefore that if the proposed soda ash plant were to purchase its ammonia from the Chittagong Urea Fertilizer Ltd. plant it could also obtain all of its required carbon dioxide from the same source.

No heat and material balances are shown in the Feasibility Report (1982) of Basic Chemicals Limited to demonstrate that as is stated in Section 5.1.2 A the required amount of carbon dioxide will be available from the captive ammonia plant and the flue gas of the boilers.

4. Domestic Market

The proposed plant is conceived to serve the domestic market for soda ash. This was estimated by Fertilizer (Planning and Development) India Ltd. (FPDIL) at 49,100 tons per year in 1985. This estimate was based upon rather incomplete Government records of imports.

The market study portion of the Basic Chemicals Limited (BCL) Feasibility Report dated January 1982 was done by M/S Social and Marketing Services and is based upon rather more detailed current information. This study (Chapter 3) places the domestic demand by 1985 at 98,000 tonnes.

It would seem necessary therefore to reconcile this 100% discrepancy.

The information given in the two reports can be compared as follows:

	<u>FPDIL 1978</u>	<u>BCL 1985</u>
Existing Industries:		
Cleaning Agent	17,000	28,800
Glass Industry	12,000	15,010
Soap (15-25% by Wt)	-	13,550
Pulp & Paper	4,000	12,600
Sodium Silicate	5,600	-
Misc.	<u>10,500</u>	<u>5,000</u>
	49,100	74,960
* New Industries:	<u>-</u>	<u>21,550</u>
Total Projected Demand - 1985	49,100	96,510

The market for by-product fertilizer grade Ammonium Chloride has been studied in some detail in both reports. Generally there is a consensus that provided the use of Ammonium Chloride is actively promoted as a substitute for urea, there is a market within the country for about 100,000 tons per year. Pricing will have to be such as to displace urea and in this sense the proposed soda ash plant will have to compete directly with the several producing urea plants already in operation as well as the new plant being brought on stream by the Chittagong Urea Fertilizer Company Ltd.

It would seem worthwhile to obtain an independent check on 1985 domestic demand for both soda ash and ammonium chloride at an early stage of further plant studies.

* Note that page 116 which summarizes these figures is missing in BCL Feasibility Report (1982).

5. Pricing

The Basic Chemicals Limited Feasibility Report (1973) provides in Chapter 7 the rationale for the pricing of the products from the proposed plant.

The retail price for soda ash in Dakka in June 1981 was \$613 per ton. The price in Tokyo was \$276 per ton. Adding freight, and without any import duty protection, the C & F price Chittagong was \$311 per ton, reflecting a 99% markup.

The basic financial analyses provided in this report are predicated upon a C & F January, 1966 price of \$450 per ton for soda ash and \$150 per ton for ammonium chloride.

No indication is given of whether import duty protection for the new industry is expected. No analysis of world market trends is provided.

A more detailed study of pricing structure would appear to be required to support financial calculations.

6. Plant Location - Utilities- Infrastructure

The basic question of source of ammonia supply, i.e. whether purchased or produced at high cost in a small plant, overshadows the selection of plant location. This in turn precludes any detailed comment on utilities and infrastructure at this time.

As indicated in Item 3 of Appendix B, the Sponsors are open to the

suggestion that a plantsite immediately adjacent to the CUFCO or the proposed KAFCO urea fertilizer plants could have advantages if the Government were to implement overall planning for the Chittagong Port Area.

In the absence of any such coordinated overall planning the Sponsors have based the initial analysis upon a completely self contained plant at Kalurghat 20 kilometers from the Port Area, with a 150 TPD Ammonia Plant, 13 MW electrical power generation, 5000 TPH river cooling water supply, waste treatment facilities, water-rail-road transportation, and housing and facilities for employees. It is not clear at this point which location would minimize capital and operating costs.

It can be noted that a similar comment on the need for Government planning applies to the proposed Methanol project which is under review by the IDB.

Additional detailed studies would appear to be required before the effect of plant location on capital and operating costs can be evaluated, and plant location finalized.

7. Plant Capital Requirement - Financing Plan

The estimated plant capital requirement for 1985 plant completion is \$163.62 million of which \$12.55 million is working capital and \$29.99 million is physical contingency and escalation. The detail of this cost is given in Chapter 8 of the Basic Chemicals Limited Feasibility Report (1982).

While there was no opportunity for the IDB Appraisal Team to make any check on this figure in the time allotted, the form in which it is

presented raises several obvious questions:

1. \$19.06 million for professional services appears very high.
2. Site development cost of \$0.88 million may be low.
3. No basis is shown for the estimated cost of \$34.15 million for process equipment.
4. Proportional to total cost the allowance of \$27.61 million for Utility and Offsite Facilities looks low.
5. For the purpose of calculating interest during construction four basic cases are postulated and four alternate financing plans have been proposed. Detailed financial calculations follow these alternates. Interest rates selected are 10% and 14%. Debt/Equity ratios selected are 60:40 and 50:50. Probably a wider range of interest rates ranging down to say 5% and Debt/Equity Ratios as high as 70:30 should be investigated.

Development of further detailed financial calculations are probably premature until answers are available to such basic engineering questions as whether ammonia can be purchased, selection of plant location, and more accurate estimates of cost of process plant and offsites can be prepared.

To illustrate this point - The Fertilizer (Planning and Development India Ltd. (1978) study projects the cost of a captive 100 TPD Ammonia Plant at 55.79 million. Although no split in the \$151.07 million capital cost of the 330 TPD Soda Ash Plant and 150 TPD Ammonia Plant is included for the Basic Chemicals LTD. plant, it appears the total capital cost of the project could be reduced by as much as 1/3 to 1/2 by the purchase of ammonia and the elimination of the captive ammonia plant.

What can be said is that financial calculations limited to date appear to have been based on the assumed large capital investment.

prepared by the Basic Chemicals Ltd. is a conservative side due to

8. Plant Operating Costs

The Basic Chemicals Limited Feasibility Report (1982) provides no detail on how the production costs are derived. Presumably what has been used are standardized industry figures. Eventually production costs must be calculated in detail for actual plant design conditions.

In view of the large number of parameters yet to be established any further analysis of operating costs at this stage appears to be premature.

9. Probable Economic Viability

Nothing in the data presented in the Fertilizer (Planning and Design) India Ltd. Report (1978) or the Basic Chemicals Limited Feasibility Report (1982) indicates that the proposed plant is not economically viable.

Section 9.2 and 9.3 of the Basic Chemicals Limited Feasibility Report (1982) refer to the overall Economic Evaluation of the Project and Other Benefits to be derived by Bangladesh from the project.

Certainly, however, a great deal of additional study would appear to be required to establish the priority which the project should take in planning overall governmental financial priorities and commitments. The establishment of such priorities can only come after a complete final feasibility report has been prepared and reviewed, and financing terms have been established.

CONCLUSIONS :

1. The report prepared by Fertilizer (Planning and Development) India(1978) continues to provide the best overview of the economic viability of the project. As indicated in Chapter 10 based upon a plant utilizing the Dual Process, and purchasing ammonia from the Chittagong Urea Fertilizer Company Ltd., an average return on equity of 22% and an internal rate of return of 8% are indicated.
2. The alternative outlined in the Feasibility Report (1982) prepared by Basic Chemicals Ltd. is obviously less attractive because of the high capital cost for a captive ammonia plant and the resultant high production costs. The financial results presented in this report are not considered reliable because not enough preliminary engineering has been done to provide definitive specifications for the plant and accurate cost estimates. Too many design parameters remain unsettled.
3. For the Islamic Development Bank to be able to appraise the project for possible financing, a major preliminary engineering study will have to be completed and the BCL Feasibility Study revised accordingly. Various other portions of the Feasibility Study, such as size of domestic market, world market trends, product pricing structure, infrastructure developments in the Chittagong Port Area, financial plan alternatives, and plant operating costs also appear to require further more detailed investigation and analysis.

4. The chart appended to this report as Appendix F illustrates the detailed engineering information which must be developed as a base for reliable cost estimates. This chart is from "Project Engineering of Process Plants", Authors HF Rase and MH Barrow, published by John Wiley & Sons Inc., 1957.

This chart which has been used by the writer in bringing many process plants from the feasibility study stage through design, construction, and startup, shows that in order to obtain cost estimates which are reliable within 10% a Type A estimate must be prepared.

While the actual dollar figures shown for the cost of preparing the several types of estimates are now out of date (1957-1962) it can be noted that the cost will normally be about 0.4% of the turnkey plant cost. Thus if the proposed plant cost is \$100-150 million the cost of the preliminary engineering and estimates which must be prepared by the Sponsors at this stage would be \$400,000-600,000. Without an effort of this magnitude it is unlikely that reliable data can be developed for the purpose of further bank financing appraisals.

BASIC CHEMICALS LTD.

MINUTES OF MEETING HELD ON AUGUST 26, 1982 AT 3 P.M.

Renue : Sponsors' Head office at 7th floor,
Amin Court, Motijheel, Dacca.

Attended by : ISDB Mr. Nasimuddin Siddiqui
Mr. Musa Muzaffar Gul.

BCL Mr. Syed Khaledur Rahman
Mr. Syed Shohudur Rahman
Mr. Mirza Najmul Huda.

1. BCL briefly mentioned the progress so far as follows:
 - (a) This group is one of the leading private enterprises in Bangladesh and has a very sound technical team.
 - (b) The first plant producing Starch, Glucose and Dextrose from Cassava is now on stream, Cassava is cultivated by the sponsors themselves. ISDB was invited to visit the plant, a short drive from Dacca.
 - (c) The second plant is now under construction at Joypurhat, Bogra, in Northern Bangladesh. This plant would produce Liquid Sugar from raw molasses, a waste from cane sugar mills and is expected to go on stream around mid 1983.
 - (d) The sponsors had several meetings in Dacca, Jeddah and again in Dacca during 1981 and 1982. A copy of the feasibility report was submitted in Jeddah in February 1982.
 - (e) The sponsors visited Denmark in July 1981 and Japan in May 1981 with a view to explore possibilities of technical collaboration with world renowned licensees and plant suppliers.
 - (f) Government agencies like Department of Industries, Chemical Industries Corporation (BCIC), etc. had already been approached and given green to the sponsors.

2. BCL submitted following documents that would form an addenda to the feasibility report, submitted to ISDB head office in Jeddah by BCL Directors Mr. S.K. Rahman and Mr. M.H. Khan in February this year:

- (a) Marketability of Soda Ash.
- (b) Marketability of co-product, Ammonium Chloride, as fertilizer.
- (c) Recent Newspaper report on export of Urea from Bangladesh.
- (d) Supply of salt from Small and Cottage Industries Corporation (BSCIC).
- (e) Technical manpower available in the country and already in the spcnsor's employment.

The above documents were prepared with a view to answer queries raised by ISDB both in Jeddah and in subsequent meetings in Dacca. BCL would also submit draft copy of memorandum/articles of association to ISDB team before they left Dacca.

3. ISDB requested BCL to submit the following additional information:

- (a) Summary of price quotation received from prospective technical collaborators.
- (b) Capacity utilization of various local industries (for e.g. glass making) requiring imported Soda Ash as raw material.
- (c) Reference to international publication (not included in BCL addenda) like UN trade statistics, etc.

BASIC CHEMICALS LTD.

Minutes of Meeting held on September 1, 1982 at 3 P.M.

Venue : Banani residence of Mr. S.K. Rahman

Attended by : ISDB Mr. Nasimuddin Siddiqui
Mr. Muzaffar Gul
Mr. B.D. Bohna

BCL Mr. Syed Khaledur Rahman
Mr. Syed Shohudur Rahman
Mr. Mirza Najmul Huda

1. BCL submitted the following documents to ISDB:
 - (a) Draft copy of memorandum and articles of association of proposed Company.
 - (b) Minutes of meeting held on August 26, 1982.
 - (c) Write up on price summary including names of prospective technical collaborators.
 - (d) Copy of introductory letter from sponsors' Bank, BCCI.
 - (e) Copy of feasibility report dated January 1982.
2. Discussion was held on some general and technical aspects with Mr. Bohna at sponsors' head office earlier in the morning.
3. The proposed site at two locations (Kalurghat in feasibility report or next to KAFCO) were discussed. ISDB team had visited the site next to KAFCO earlier this week. The sponsors' earlier preference for the Kalurghat site was because of availability of sweet water required for cooling as well as for process. However, if ISDB were to be involved in KAFCO, methanol project, Soda Ash project, etc., and these plants could be located near one another, then utilities (electric power, steam, sweet water, Air, Ammonia, etc.) could be ensured as a part of ISDB requirement. An example could be ISDB owning and leasing a boiler plant for KAFCO that would have enough capacity to supply Soda Ash plant, etc.
4. The following major points were mentioned by ISDB relating to the feasibility report:
 - (a) Consider buying salt from abroad.
 - (b) Consider production of salt by sponsors themselves.
 - (c) Copy of document specifying government policy on tax holiday and tariff protection.

- (d) Recent document from TCB stating imported price of Soda Ash.
- (e) Document from BADC stating that they would purchase Co-product Ammonium Chloride.
- (f) Document showing guarantee on Gas price.

BCL assured that these and other minor matters would be attended to immediately and soon intimated to ISDB Head Office.

5. Mr. Bohna would visit the sponsors' Starch/Glucose/Destrose plant near Dacca on September 2, 1982, around 1 p.m.

PRICE SUMMARY

A detailed price summary is given in our feasibility report of January 1982, pages 120 to 123, Appendix X, Table I X.I. As mentioned, these prices have been based on mid 1981 and on several proposals received from world renowned licensees and plant suppliers/contractors. Our directors had visited Japan in May 1981 and Europe in July 1981 for discussion prior to receiving proposals. The companies who have responded to our direct contact are as follows:

<u>Company</u>	<u>Country</u>	<u>Bangladesh Experience</u>
1. Central Glass Co.	Japan	
2. Toyo Engineering Corp.	Japan	Engineering, Procurement, Construction of Ammonia and Urea plant, 1967-1970.
3. Toyo Soda Mfg. Co.	Japan	
4. Hitachi Zosen	Japan	Triple superphosphate (TSP) plant, 1968-1970.
5. Asahi Glass Co.	Japan	
6. Tsukishima Kikai Co.	Japan	
7. Haldor Topsoe As	Denmark	Bidder for Chittagong Urea plant (KAFCO)
8. Salins Du Midi	France	
9. Humphreys and Glasgow	England	
10. Akzo Zout Chemie	Holland	
11. CTIP Societa	Italy	

Among the above mentioned companies, the following companies have prior arrangement between themselves, as regards licensee and plant supplier/constructor for this kind of project:

- A. Central Glass Co. and Toyo Engineering Corp.
- B. Toyo Soda Mfg. Co. and Hitachi Zosen

Other licensee and plant supplier/constructor are not very firm on prior arrangement with one another.

বাংলাদেশ ক্ষুদ্র ও কুটির শিল্প সংস্থা
১৩৭/১৩৮, মতিঝিল বাণিজ্যিক এলাকা
ঢাকা-২

টেলিফোন : { ২৪৩২০২-২৪৩২০৪
২৫৫০২৩-২৫৫০২৪
২৫৫৭৯৪-২৫৫৭৯৫

ভাষা : কন্নড়

ডাক বাস : ১৮০ রমনা।



137/138, Motijheel Commercial Area
Dacca-2

TELEPHONES : { 243202-243204
255023-255024
255794-255795

TELEGRAM : KHUDRASHILPA

P. O. BOX : 180, RAMNA

No. Proj-I-Salt-19/75-82/392

Dated 16.8.82

To
The Managing Director,
Basic Chemicals Ltd.,
Amin Court (7th floor),
62/63, Motijheel Commercial Area,
Dacca-2.

Sub: Supply of 120,000 M.T. per year of refined salt

Dear Sir,

We refer to your letter No.BCL/Adm/03-366 dated 11.8.82 wherein BSCIC was requested for supply of 120,000 M.Tons of refined salt for the proposed Soda Ash Plant.

We write to inform you that salt is being produced in the Coastal areas of the country by the Cottage Workers and the annual production capacity of the Cottage Units according to our calculation by 1985 will be around 7 lac tons of refined salt as against anticipated requirement of the country 6 lac tons. Thus leaving a surplus of 1 lac ton with the Cottage Industrial Units/Crushers. But it may be mentioned here that the production of salt is highly dependent on nature and the anticipated production target may not be achieved.

It may further be pointed out in this connection that BSCIC is solely responsible for promotion and development of Salt Industry in the country and the marketing of the produce is usually done through normal marketing channels and as such you shall have to arrange supply from the traders.

Yours faithfully,

(Akhtari Begum),
Director(Projects),
BSCIC,Dacca.

Technical Personnel in the existing industries.

The entrepreneurs of Basic Chemicals Ltd. already has started operating a starch, glucose and dextrose factory at Tarabo, 20 Km from Dacca. Their starch and glucose plant is already in operation and the dextrose plant will start production in September, 1982.

They have already introduced a new crop, CASSAVA and has a plantation area of 2000 acres in the first year. Cassava is used to feed the starch plant. They expect to increase the plantation to 5,000 acres by 1983.

They have found a new use for cane molasses which used to be dumped previously. They will install a plant to produce liquid sugar from cane molasses. The machinery for this plant is already at site and the erection is expected to start in October 1982.

To manage all these industries and plantation two of the entrepreneurs are Master of Business Administration (MBA) two of them are engineers and one of them is an Ex-Civil Servant of Pakistan.

In addition they have on their full time pay roll one MBA, six Engineers and 15 Diploma in various fields of Engineering.

In fact, they have the largest number of technically qualified personnel in the private sector.

The first Paper Mill was set up in Bangladesh in 1952. Since then we have set up 2 more Paper Mills and one Pulp Mill, Bangladesh has set up the first Urea fertilizer

factory in 1959. Since then we have set up 2 more Urea plants and one TSP fertilizer plant. Bangladesh is also planning to set up two more Urea fertilizer factories only for export. Soon we will be leader in production and export of Urea in this region.

This means that there is no dearth of technically trained personnel in Bangladesh capable to run heavy chemical industry.

When Basic Chemicals Limited will be in the tendering stage, the entrepreneurs expect to have some foreign technical personnel on their pay roll. This will be in addition to what they already have and what they can get from the country.

The Bio-data of some of the Key personnel is given below:

B I O - D A T A

SYED KHALEDUR RAHMAN (39 years)
Managing Director
Roots Plantations Ltd.

- Master of Business Administration from University of Dacca - 1969.
- Expert in Management of large companies/
- Managing Director, Bangladesh Development Corporation, a construction firm engaged in construction of transmission line for the Power Development Board - 3 years.
- Managing Director, Computer Accessories Ltd an industry to produce continuous forms for computers - 2 years.
- General Manager, Kumudini Welfare Trust of Bengal, a business concern engaged in Inland Water transportation jute baling, export of jute and jute goods, hospital and School Management - 3 years.

B I O - D A T A

MIRZA NAJMUL HUDA (36 years)
Technical Director
Rahman Chemicals Ltd / Northern Distilleries Ltd.

- Bachelor of Science in Mechanical Engineering from Bangladesh University of Engineering & Technology, Dacca in 1968.
- Master of Business Administration from University of Dacca in 1970.
- Expert in Estimation, Planning, Execution, Progress and efficiency control & work site control.
- Internship at Dhanmondi Power Station, Dacca - 8 weeks.
- Internship at Government Vehicles Workshop, Dacca - 4 weeks.
- Internship at Chittagong Steel Mills Ltd - 8 weeks.
- Trainee at Strabag Bau AG, Cologne, West Germany - 6 months.
- Worked as Project Engineer, Jurong Engineering (Pte) Ltd. a company engaged in civil, mechanical and erection of large projects; and consultancy and turn-key supply of small projects and a sister concern of IHI Shipyard of Japan - 7 years.
- Worked as Chief Engineer, Saudi Jurong (Pte) Ltd for 3 years.
- Projects completed since 1972:
 - Lube Plant at Esso phase II refinery in Singapore.
 - Welder training in Singapore (for UAE LNG project).
 - Shop fabrication for 2 x 1,000 Ton fuel oil storage tanks, Singapore.

- On site erection of floatation plant at copper mine, Sabah , East Malaysia.
- Stator lifting at power station, Johore, West Malaysia.
- Jetty piping for Sumitomo Chemical tankyard at Johore, West Malaysia.
- Complete turn key project at activated carbon plant in Johore, West Malaysia.
- Renewal of styrene monomer tank roof at Sumitomo tankyard in Johore, West Malaysia.
- Principal consultancy, erection of equipment and piping, insulation and painting works at palm oil refinery in Johore, West Malaysia.
- Civil, Mechanical and Electrical works for effluent treatment plant for Beecham Pharmaceuticals, Singapore.

B I O - D A T A

SYED SHOHUDUR RAHMAN (38 years)
Production Director
Rahman Chemicals Ltd / Northern Distilleries Ltd.

- Bachelor of Science in Chemical Engineering from the Bangladesh University of Engineering & Technology, Dacca in 1968.
- Expert in Feasibility Study and Production Planning.
- Trained in Europe in the production and maintenance of Starch, Dextrose and Glucose Plant - 12 weeks.
- Trained in Europe on the production of Liquid Sugar from Cane molasses - 12 weeks.
- Went to Europe several times to finalise the details of the Contract for Rahman Chemicals Ltd. and Northern Distilleries Ltd.
- Worked as Chemical Engineer at Technical Consultants Ltd to prepare the feasibility study for Chittagong Urea Fertilizer Project - 1 year.
- Worked as Chemical Engineer at Hydrocarbon Consultants and helped to prepare the feasibility study for Cement Clinker Grinding Factory at Mongla Port - 2 years.
- Worked in Jurong Engineering (Pte) Ltd. Singapore - 2 years.
- Worked as Chemical Engineer, Bangladesh Industrial Development Corporation - 4 years.

B I O - D A T A

S. M. KAMALUDDIN (36 years)
Factory Manager
Rahman Chemicals Ltd.

- Bachelor of Science in Chemical Engineering in 1968 from Bangladesh University of Engineering & Technology, Dacca.
- Expert in the operation & maintenance of Ammonia Plant.
- Trained in operation and maintenance of Sulphuric Acid, Phosphoric Acid and T.S.P. Fertilizer Plants in Japan for 16 weeks.
- Trained in workshop skill like gas cutting, gas & electric welding, pipe fitting, bench fitting etc. at the Bangladesh German Technical Training Centre under the guidance of Foreign Experts for 16 weeks.
- Trained in operation and maintenance of Urea & Ammonia Plant at the Urea Fertilizer Factory, Ghorasal. This training included process study, operating techniques and mechanical aspects of various machines like turbines, compressors, pumps, blowers, reformers, absorbers, desorbers, converters etc. This training also included the operation of off-site facilities like water treatment, bagging plant etc for 1 year.
- Trained in operation and maintenance of ammonia and urea plants at PUSRI, Indonesia, covering both theoretical background and on the job training in various plants. Mechanical and Chemical technology involved in various machines, equipments and instrument network were thoroughly studied for 16 weeks.
- Theoretical and in plant training on the various processes for Ammonia production. Theoretical features of the processes were thoroughly studied. Various equipments and instrument network of the plant was also studied and operated for 12 weeks in CHEMZ LINE, AUSTRIA.
- Asstt. Production Manager, Ammonia Plant, Ashuganj Fertilizer Factory, Bangladesh - 4 years.
- Superintendent, Recovery Plant, Sylhet Pulp & Paper Mills, Bangladesh - 2years.
- Chemical Engineer, Triple Superphosphate Fertilizer Factory, Chittagong, Bangladesh - 8 years.

BIO-DATA

MD. IMDADUL HAQ (38 years)
Maintenance Manager, Rahman Chemicals Ltd.

Bachelor of Science in Mechanical Engineering
from Rajshahi Engineering College in 1972.

Expert in erection and maintenance of Sugar Mills.

Was responsible for the erection of the Starch,
Glucose & Dextrose Plant machinery the auxilliary
for Rahman Chemicals Ltd., Bangladesh. Now he is
looking after the maintenance of the Plant.

Supervised the erection of Faridpur Sugar Mills,
Bangladesh and later worked as the Chief of the
Maintenance Department - 2 years.

Worked in the Maintenance Department of
North Bengal Sugar Mills Ltd. - 2 years.

Trained in Europe in the maintenance of Starch,
Dextrose and Glucose Plant for 12 weeks.

B I O - D A T A

IFTIKHAR AHMED (33 years)
Senior Analyst
Rahman Chemicals Ltd.

- Master of Science in Chemistry from Rajshahi University - 1972.
- Expert in Quality Control and Process Control.
- Trained in Production and Work Study at the Management Development Centre, Bangladesh for 8 weeks.
- Trained in Quality Control and Good Manufacturing Practice from the Bangladesh Drug Administration in collaboration with World Health Organization for 2 weeks.
- Worked as Chemist in the process control Department in Sylhet Pulp & Paper Mills Ltd, Bangladesh for 2 years.
- Worked as Chemist in the Quality Control Department of Orion Laboratories a producer of Pharmaceutical Products for 5 years.

B I O - D A T A

SYED HASAN MAHMOOD (28 years)
Electrical Engineer
Northern Distilleries Ltd/Rahman Chemicals Ltd.

- Bachelor of Science degree in Electrical Engineering from the Bangladesh University of Engineering & Technology, Dacca in 1979.
- Expert in electrical installation and maintenance of Electrical Machinery and Automatic Process Control.
- Trained in Europe in the Automatic Process Control using microprocessor for the production of liquid sugar from cane molasses
- 12 weeks.
- Worked as Planning Engineer, EAH Consultants, Dacca and was responsible for electrical layout and estimation of electrical contracts.
- Worked in Rahman Chemicals Ltd during the erection and testing of electrical machinery and control instruments and also doing the running maintenance of Starch, Dextrose & Glucose Plant.

B I O - D A T A

AHMAD ULLAH BHUIYAN (39 years)
Planning Manager
Northern Distilleries Ltd.

- Bachelor of Science in Mechanical Engineering from West Pakistan University of Engineering and Technology, Lahore, 1966.
- Expert in production planning and inventory control.
- Trained in overhauling, maintenance and repair of small and heavy diesel engine from Marine Diesel Engineering Training Centre in Bangladesh - 12 weeks.
- Trained in workshop maintenance from Management Development Centre of Bangladesh 3 weeks.
- Trained in planning and production of small diesel engine from M/s. Klokner Humbolt-Duetz AG, West Germany - 1 year.
- Trained in work study from the institute of REFA, Cologne, West Germany - 6 months.
- Trained in Computer programming from the University of Singapore.
- Worked as a Teacher in Ngee Ann Technical College in Singapore. This college offers diploma in Engineering and was affiliated to Central Polytechnic London - 5 years.
- Worked as Planning Engineer in Bangladesh Diesel Plant during inception and erection and successful commercial production of the factory. Was incharge of production planning, documentation, amendment services and procurement of raw materials for the manufacture of 3000 Nos. of diesel engine per annum. Was also responsible for inventory control and maintenance of diesel engine and pumps used for irrigation by BADC. He was responsible for organising training programme for local engineers and technicians.
- Worked as Planning Engineer in the International Project Planning Division of Klokner Humbolt-Duetz AG, West Germany for 2 years. He was responsible for preparing layout, selection of production machinery and preparing plan for manpower requirement, raw materials estimation, estimation of jigs and fixtures Bangladesh Diesel Plant.

B I O - D A T A

A.F.M. MAHBUBUR RAHMAN (35 years)
Production Manager
Northern Distilleries Ltd.

- Bachelor of Science in Chemical Engineering from Bangladesh University of Engineering & Technology, Dacca - 1968.
- Expert in production and maintenance of Paper & Board Mills.
- Trained in operation and maintenance of Hardboard Process in Canada for 13 weeks.
- Trained in operation and maintenance of Liquid Sugar Process in Europe for 12 weeks.
- Published a paper "On site Preparation of Emulsified Paraffin Wax" in Technical Journal of Bangladesh Chemical Industries Corporation, March 1980.
- Pulp Mill Superintendent, Khulna Newsprint Mills Ltd. for 4 years. Supervised the work of 700 men. During this time the Pulp Mill was expanded by adding new cooking vessels to reduce the dependence on imported pulp. The paper machines were also modernised.
- Maintenance Engineer, Khulna Hardboard Mills Ltd for 5 years. In addition to regular maintenance work and boiler operation, he was also responsible for operation and process modification.
- Chemical Engineer, Khulna Hardboard Mills Ltd. for 4 years in the operation and quality control department.

B I O - D A T A

FAZLUR RAHMAN (35 years)
Chief Engineer
Northern Distilleries Ltd.

- Bachelor of Science in Mechanical Engineering from the Bangladesh University of Engineering & Technology, Dacca - 1968.
- Expert in Heavy fabrication and installation like machinery for Sugar Mills, Steel Mills, Paper Mills and handling equipment, fabrication, repair and maintenance of river crafts and ocean going vessels; supervision of the workshop of shipyard.
- Trained in the Management Development Centre, Dacca in (a) Job relation (b) Job instruction (c) Job methods (d) Safety & (e) Plant maintenance. Each of these training was for a period of approx. 2 weeks.
- Visited Bulgaria, Poland, Belgium and Great Britain in 1978 for procurement of Harbour Crafts and pre-shipment inspection of handling and road building machinery - 1 month.
- Visited Belgium, Holland, Great Britain in 1979 for final trial of Harbour vessels procured by the Port of Chalna Authority.
- Visited Yougoslavia, Great Britain in 1981 for the procurement of dock side portal cranes - 2 weeks.
- Trained in Europe on erection, operation & maintenance of machinery for the Liquid Sugar Manufacturing Plant - 12 weeks.
- Worked as Deputy Chief Engineer (Mechanical), Port of Chalna Authority on recommendation of the Bangladesh Public Service Commission for 5 years. During this time he was the head of Mech. Marine, Electrical Departments and was responsible for repair, maintenance and operation marine vessels, handling equipments, communication equipments, generation and distribution of electricity on shore bases.

- Worked as Mechanical Engineer of Khulna Shipyard for 8 years (1968-76). He was incharge of machine shop and maintenance shop and built marine vessels and other machine spares for other mills such as Sugar Mills, Jute Mills, Cotton Mills, Paper & Board Mills, Match Factories, Power Houses etc.

- Worked as Part-time Lecturer in Khulna Engineering College for two years, and as Examiner of Fluid Mechanics & Automobile Engineering of Rajshahi University.

BIO-DATA

A B M SHAHABUDDIN (35 years)
Director, Roots Plantation Ltd.

Expert in fabrication, erection; project evaluation
and management of large organisation.

Bachelor of Science in Metallurgical Engineering
from Bangladesh University of Engineering and
Technology, Dacca in 1968.

Carried out research at the Imperial College of
Science & Technology, London, leading to DIC in
1975.

Supervised the erection of JOUEIN Sugar Factory, Iran,
a 2000 TPD beet sugar mill - - 1 year.

Worked with Jurong Engineering (Pte) Ltd., a sister
concern of IHI Shipyard - 1 year and completed the
following projects :

- (a) Installed 2 x 5^T Jetty Crane at Jurong Shipyard,
Singapore.
- (b) Conducted Welder's Training Programme for
LNG tank Project for Abu Dhabi.
- (c) Fabricated 2 x 1000^T Fuel Oil Tank at Singapore.
- (d) Erected 2 x 1000^T Storage Tank with pumps and
piping net work at East Malaysia.

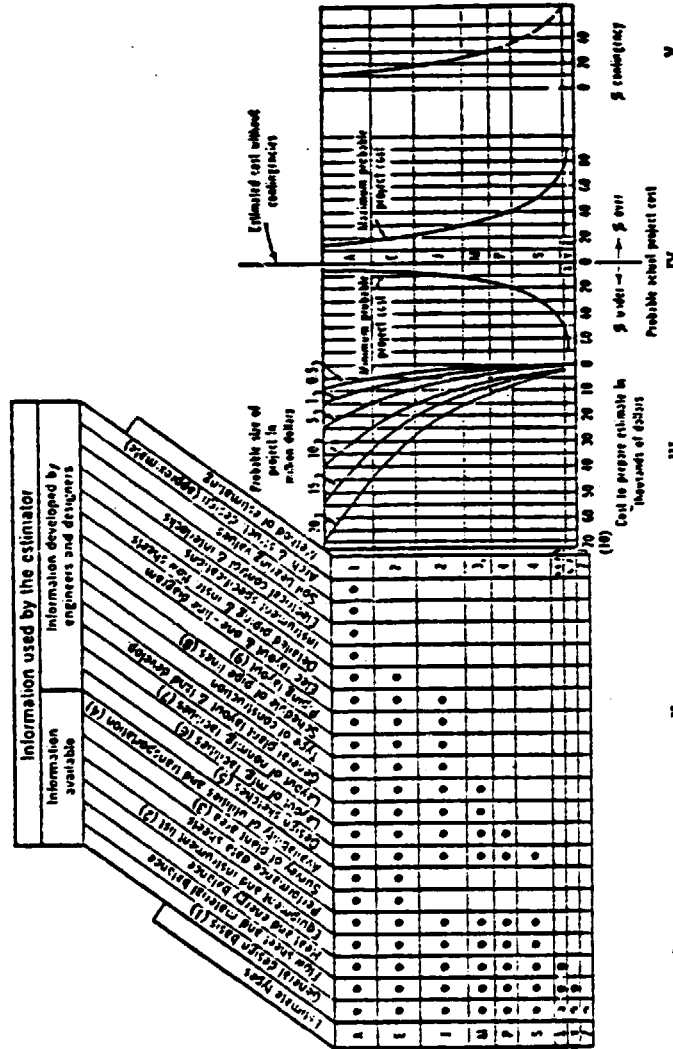
(e) Installed a Drum Filter Plant for a Copper Mining Project at East Malaysia for OMRD.

Worked as Staff Officer, Bangladesh Armed Forces during the War of Liberation - 1 year.

Worked as Metalurgical, Engineer Chittagong Steel Mills Ltd., Bangladesh and was responsible for operation, planning and quality control - 4 years.

Worked as Metalurgical Engineer, National Iron and Steel Mills, Bangladesh for the salvation and reconstruction of the war rakaged mill.

Project Engineering of Process Plants



- I. Product to be made, specifications and storage provisions; plant capacity, operating stream flow, provisions for expansion; raw materials, waste and effluents
2. Showing number of each item required, capacity and materials of construction
3. List of valves and line drawings
4. Description of laboratory and service facilities required
5. Detailed items of equipment
6. Showing equipment in place and operation
7. Utilities and service facilities, roads, streets, etc.
8. Site, materials of construction
9. Schematic of equipment and piping layout
10. Cost for preparing estimates; comparison of alternate estimates and well set stage in any construction drawings or specifications. Does not include cost of preparing the information available on the cost of sub-set investigations to determine and bring ready



