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Shahtaj Sugar Mills Limited

72/C-1, M. M. Alam Road, Gulberg III, Lahore - 54660 (Pakistan)

The Registrar
National Electric Power Regulatory Authority
2nd Floor, OPF Building,
Sector G-5/2,
Islamabad

Subject: Application for a Generation License

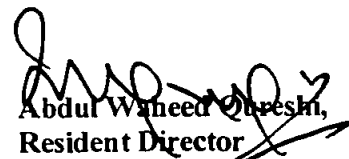
I, Abdul Waheed Qureshi, Resident Director, being the duly authorized representative of Shahtaj Sugar Mills Limited ("SSML") by virtue of Board Resolution dated January 27, 2016, hereby apply to the National Electric Power Regulatory Authority for the grant of a Generation License to the Shahtaj Sugar Mills Limited pursuant to section 15 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997.

I certify that the documents-in-support attached with this application are prepared and submitted in conformity with the provisions of the National Electric Power Regulatory Authority Licensing (Application and Modification Procedure) Regulations, 1999, and undertake to abide by the terms and provisions of the above-said regulations. I further undertake and confirm that the information provided in the attached documents-in-support is true and correct to the best of my knowledge and belief.

A Cashier's Cheque in the sum of Rupees 214,512/= (two hundred and fourteen thousand five hundred and twelve rupees only), being the non-refundable license application fee calculated in accordance with Schedule II to the National Electric Power Regulatory Authority Licensing (Application and Modification Procedure) Regulations, 1999, is also attached herewith.

Date: June 08, 2016




Abdul Waheed Qureshi,
Resident Director
Shahtaj Sugar Mills Limited



Shahtaj Sugar Mills Limited

19, DOCKYARD ROAD, WEST WHARF, P.O. BOX NO. 4766, KARACHI-74000 (PAKISTAN)

Phones : 32313934-38, 32312834, 32310973 Fax : (92-21) 32310623, 32205723

Email: jamilbutt@shahtaj.com

22ND APRIL, 2016

EXTRACT FROM MINUTES OF MEETING OF BOARD OF DIRECTORS OF SHAHTAJ SUGAR MILLS LIMITED HELD ON WEDNESDAY THE 27TH JANUARY, 2016 AT 11.30 A.M. AT THE HEAD OFFICE OF THE COMPANY, SHAHNAWAZ BUILDING, 19, DOCKYARD ROAD, WEST WHARF, KARACHI

The following resolutions were discussed by the Board and approved unanimously.

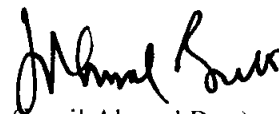
“RESOLVED THAT Shahtaj Sugar Mills Limited (a company incorporated under the laws of Pakistan with its registered office located at 19, Dockyard Road, West Wharf, Karachi. (the Company) be and is hereby authorized to file application for the grant of Generation License for submission at National Electric Power Regulatory Authority (NEPRA) in respect of its 15 MW high pressure bagasse based power generation project to be located at District Mandi Bahauddin, Province of Punjab, Pakistan. (the Project) and in relation thereto, enter into and execute all required documents, make all filings and pay all applicable fees, in each case, of any nature whatsoever as required.”

“FURTHER RESOLVED THAT in respect of application for the grant of Generation License (including any modification to the application for the Grant of Generation License) for submission to National Electric Power Regulatory Authority, Mr. Abdul Waheed Qureshi, Resident Director be and is hereby empowered and authorized for and on behalf of the Company to:

- (i) Review, execute, submit and deliver the Generation License Application (including any modification to the application for the Grant of Generation License) and related documentation required by National Electric Power Regulatory Authority, including any contracts, documents, power of attorney, affidavits, statements, letters, forms, applications, deeds, guarantees, undertakings, approvals, memoranda, amendments, letters, communications, notices, certificates, requests, statements and any other instruments of any nature whatsoever;
- (ii) Sign and execute necessary documentation, pay the necessary fees, appear before the National Electric Power Regulatory Authority as needed, and do all acts necessary for completion and processing of the Generation License Application (modification to the application for the Grant of Generation License);
- (iii) Do all such acts, matters and things as may be necessary for carrying out the purposes aforesaid and giving full effect to the above resolutions/resolution”.

“AND FURTHER RESOLVED THAT Mr. Abdul Waheed Qureshi, Resident Director be and is hereby authorized to delegate all or any of the above powers in respect of the foregoing to any other officials of the Company as deemed appropriate.”

Certified True Copy
for SHAHTAJ SUGAR MILLS LIMITED


(Jamil Ahmad Butt)
Company Secretary

Head Office : 72/C-1, M.M. Alam Road, Gulberg-III, Lahore-54660 (Pakistan).

Phones : +92-42-35710482-84 Fax: +92-42-35711904 Email: finance@shahtajsugar.com

Mills : MANDI BAHAUDDIN-50400, Phones: +92-546-501147-49, 508047-48 Fax: +92-546-501768 Email: mills@shahtajsugar.com

**ANNEX 13 – TYPE, TECHNOLOGY, MODEL, TECHNICAL DETAILS AND
DESIGN FACILITIES**

Regulation 3(5)(g)(a)

TECHNOLOGY

Bagasse and Other Bio Fuel Based Thermal Power Plant

High pressure boiler having the steam pressure 67 bar/Cm² will be installed for steam generation. There after the high pressure steam will be used in steam turbo generator which will be compatible with the boiler steam pressure. Installed capacity of Power Plant will be 32 MW. During crushing season 15 MW and during Off Season 9.5 MW will be exported to grid station at 11 KV and then step up to 132 KV for national Power Transmission line.

1) Fuel

- **Bagasse**

After extraction of juice the fibrous residual in the cane is called Bagasse which is used as fuel in boiler for steam generation.

2) Size of Plant

- Power generation capacity 32 MW
- Number of Steam Turbines 02 Nos.
- Number of Boiler 01 No.

Specifications of Equipment

(1) **Turbo Generator**

(a) Back Pressure Turbine

- Make HTC China
- Model 2016
- Power 16 MW
- Steam Pressure 65 Bar / Cm²
- Steam Temperature 480 °C

(b) Extraction Condensing Turbine

- Make HTC China
- Model 2016
- Power 16 MW
- Steam Pressure 65 Bar / Cm²
- Steam Temperature 480 °C

(2) **Boiler**

- Make Descon
- Model 2015
- Capacity 135 Ton/hr.
- Steam Pressure 67 Bar / Cm²
- Steam Temperature 480 °C

(3) **Switch Yard**

- Switch Yard (11 to 132 KV) comprising of two bays of 2x20 to 26 MW transformers.

Introduction

- Shahtaj Sugar Mills Limited was incorporated in Pakistan on March 27, 1965 as a public limited company under the Companies Ordinance with registered office situated in Karachi. The company is listed on Karachi and Lahore Stock Exchanges since 1972 and is engaged in the manufacturing of sugar from sugarcane. Molasses is the only significant by-product contributing the company's revenues.

Technically Shahtaj Sugar Mill is divided in to 04 main sections namely Boiler, Power House and Boiling House. Detail of production capacity:

Cane crushing capacity	10000 Ton/day
Sugar production 10 % on cane	1000 Ton/day
Bagasse production @ 29 % on cane	2900 Ton/day
Molasses production @ 4.5 % on cane	450 Ton/day
Mud production @ 3 % on cane	300 Ton/day

- The company is a member of Shahnawaz Group of Companies, which is a local conglomerate operating in diversified industries including automobile, sugar, information technology, food and beverages etc.
- The company's head office is situated in Lahore while sugar mill is located in Mandi Bahauddin, spanning a total area of 120 acres.

Sugar Plant Proposed Project

Location

- The proposed project is conceived to be setup within the premises of SSML. The land was acquired by and owned in the name of SSML. Given that sufficient open space is available with SSML and potential space use synergies, an area of 30, 000m² is proposed to be allocated to cogeneration power plant.

Capacity

- The current electricity requirement of SSML is estimated at 5.15 MW during crushing season. With the setup of 32 MW power plant, SSML is expected to export approximately 15.85 MW and 9.50 MW of electricity to National Grid during crushing and off season respectively under a Power Purchase Agreement (PPA)
- The proposed project is expected to retain approximately 1.9 and 1.88 MW during crushing and off season respectively to meet its auxiliary consumption requirements.

- Given the sugar plant operational days and availability of Bagasse, both the STGs (i.e. extraction condensing technology generator and back pressure technology generator) are assumed to be operational during crushing season. However, during the off season only the extraction condensing technology generator is assumed to be operational.

SHAHTAJ SUGAR MILLS LIMITED
PROPOSED CO-GENERATION PROJECT UNDER
BAGASSE/BIO FUEL BASED POLICY FRAMEWORK 2013

PROSPECTUS FOR GENERATION LICENSE

1. BRIEF INTRODUCTION TO SHAHTAJ SUGAR MILLS LIMITED:

Shahtaj Sugar Mills Limited was incorporated in 1965 as a public limited company and listed on both Karachi and Lahore stock exchanges. The company had started its commercial sugar production in 1967 and since then engaged in this business with a distinct name in the sector. Currently it holds 10,000 TCD crushing capacity. Molasses is the only significant by-product contributing the company's revenues

The company is one of the group companies of the shahnawaz group, which is a local conglomerate operating in diversified industries including automobile, sugar, textile, manufacturing, food and beverages, information technology etc. Following are the names of major industrial concerns of the group:

- Shahnawaz private limited
- Shahtaj services private limited
- Shahtaj textile limited
- Shezan international limited
- Comstar
- Shezan services private limited
- Hattar food products
- Nawazabad farms
- Shahnawaz engineering private limited

Vision:

To Succeed and grow to the utmost satisfaction of the customers, employees and shareholders.

Mission:

To strive for still higher levels of efficiency, cost effectiveness, productivity, profitability, customer satisfaction, congenial employee relations, profit sharing with shareholders and hence gaining further strength to continue to succeed and grow.

Corporate Strategy:

To maximize effective utilization of men, material and machines, by encouraging, supporting and rewarding employees, eliminating any waste, reducing cost aiming and establishing Shahtaj Sugar Mills Limited as the most trusted, efficient and successful name among stakeholders and customers.

Company Information:

Board of Directors:

Mr. Mahmood Nawaz (Chairman)

Mr. Muneer Nawaz (C.E.O)

Mr. Cyrus R. Cowasjee
Mr. Ijaz Ahmad
Mr. Rashed Amjad Khalid
Mr. Attaullah A. Rasheed)S.L.I.C)

Mr. M. Naeem
Mr. Samia Shah Nawaz Idris
Mr. Toqueer Nawaz
Mr. Aamir Amin (N.I.T)

Corporate Responsibility:

Shahtaj Sugar Mills Limited is a responsible corporate entity and abides by all the regulations, laws and procedures that are required and mandatory for a corporate entity in Pakistan.

Financial Statements of the entity present fairly its state of affairs, the results of its operations, cash flows and changes in equity every year. These financial statements have been audited by accredited audit firm E&Y Ford Rhodes Sidat Haider and Company Chartered Accountants. Proper books of accounts have been maintained and record as per law is saved and available with SSML.

International Accounting Standards (IAS) and International Financial Reporting Standards (IFRS) as applicable in Pakistan have been followed in preparation of financial statements. Appropriate accounting policies have been consistently applied and followed, together with professional and reasonable basis are adopted in making accounting judgments and estimates as and when required.

The system of internal control is sound in design and has been effectively implemented and monitored. System of internal auditing is soundly established and operating in the company.

There has been no material departure from the best practices of the code of corporate governance as detailed in the listing regulations. SSML had been awarded as best corporate entity in different aspects in 1984, 1985 and 2011.

All the members of Board of Directors are fully aware of their corporate responsibilities and all fully participate in training as and when required.

SSML is one of the most accredited sugar manufacturers in Pakistan. Credit worthiness can be judged by the fact that SSML had never defaulted in payments towards its growers, suppliers and financial institutions. Market standing can also be contemplated by the fact that SSML sugar selling rate remains always higher among all other sugar mills in Punjab.

Latest production data for last two years is as follow:

PRODUCTION DATA

		<u>2014-15</u>	<u>2013-14</u>
Start of Season		29.11.2014	27.11.2013
Duration	(Days)	107	100
Sugarcane Crushed	(M.Tons)	800,968.72	817,752.27

PRODUCTION

Sugar (Bagged)	(M.Tons)	74,654.00	80,434.00
Molasses	(M.Tons)	38,622.39	39,839.95

RECOVERY

Sugar	(%)	9.32	9.84
Molasses	(%)	4.82	4.87

2. DESCRIPTION OF FACILITY:

Government is encouraging local industrial setups to invest in power and energy sector and guarantee to provide best possible resources in order to cater for the increasing energy demand in the country. In relation to this a comprehensive and compact bagasse/bio fuel based policy framework 2013 is offered by the government which laid a sustainable foundation of our power project.

Given the sugar plant operational days and availability of Bagasse, both the STGs (i.e. extraction condensing technology generator and back pressure technology generator) are assumed to be operational during crushing season. However, during the off season only the extraction condensing technology generator is assumed to be operational. Salient features of the proposed facility and basic assumptions are given below:

- | | | |
|-----|--|---------|
| I. | Cane Crushing Rate | 400 TPH |
| II. | Rate of Bagasse Production to Cane Crush | 28 % |

INSTALLED CAPACITY:

- | | |
|---|-------|
| • Steam Turbo Generators STG Set 1(1*16)
(Back Pressure steam turbine) | 16 MW |
| • Steam Turbo Generators STG Set 1(1*16)
(Extraction and Condensing steam turbine) | 16 MW |
| • Total Installed Capacity | 32 MW |

OPERATIONAL CAPACITY:**DURING SEASON**

- | | |
|-------------------------------|---------|
| • Operational capacity | 22.9 MW |
| • Self consumption | 7.1 MW |
| • Spill over to national grid | 15.9 MW |

DURING OFF-SEASON: (on the basis of available bagasse)

- | | |
|------------------------|---------|
| • Operational capacity | 11.4 MW |
| • Self consumption | 1.9 MW |

- Spill over to national grid

9.5 MW

3. PROPOSED INVESTMENT FOR THE PROJECT:

<u>Estimated Project Cost</u>	%	Amount (Rs in millions)
EPC Cost	81.2%	2,138.18
Non-EPC Cost	18.8%	493.99
 Total	 100%	 <u>2,632.17</u>

Means of Financing

Developer's Equity	20%	526.44
Bank Loan (Local)	80%	2,105.73
 Total	 100%	 <u>2,632.17</u>

4. Social Impact:

The project site is situated in the mid of fertile agriculture land. Land holdings are small on the over all basis. However, there are a few landlords. Wheat, Rice, sugarcane and corn are the major cash crops. Punjab contributes about 76% to annual food grain production in the country. Cotton and rice are important crops. They are the cash crops that contribute substantially to the national exchequer. Attaining self-sufficiency in agriculture has shifted the focus of the strategies towards small and medium farming, stress on barani areas, farms-to-market roads, electrification for tube-wells and control of water logging and salinity.

Many people rear especially buffalos for producing milk even on semi commercial scale. On the over all basis most of the people belong to middle class, while a few people are economically doing well. The area is one among the other food baskets of the Punjab province.

There is a lot of awareness about the importance of education. Some people of the area are playing an important role in the politics of the country even at higher levels. Fairly reasonable proportion of the people in cities is educated. While in villages, like in other parts of the Punjab province, percentage of educated people is low. Modern means of communication including television, radio, telephone, fax, e-mail and newspapers are within the reach of majority of the people especially in the cities. The socio-economic values are subject to change in cities specifically under the influence of media especially television.

The project site is connected with other parts of the country by roads and railway. These facilities provide good opportunities to the people to mix up with the public of the other parts of the country. The economy of the district is growing quite fastly.

There is a trend in setting industries in the area. Already Shahtaj Sugar Mills Ltd. has set a trend for further industrialization of the area.

There also exists a highly educated and well placed segment of society, this segment is quite affluent and socially and politically well off also. Their way of life is comparable with that of any developed segment of the society in Pakistan. This segment of the society is playing leadership role for the people of the area.

Most of the people belong to villages. But they are quite aware of the socio economic, political and other development activities of the country. Mostly, villagers follow old traditions in almost every walk of their life. Elderly people command respect and play deciding role in decision making. A large cross section of the older generation is uneducated. But due to awareness about education younger generation of both sexes, is now trying to get education in almost every department including science and technology on preferential basis. There is a rising trend in the society to change their old traditional socioeconomic pattern of life. Print and electronic media are playing great role in bringing tangible change in the old pattern of life.

Environmentally speaking the carrying capacity of the environment is not yet utilized. The project activity, under the proposed strict operational environmental controls, is not going to leave adverse impacts on all out environment. The operational Environmental Management Plan and Environmental Monitoring Plan further provide protection to the environment around. Legal compliance of environmental monitoring with NEQS standards are to doubly ensure environmental protection of all the segments of the environment.

The project will pay large sums of Government taxes which will be another addition to the earnings of the national exchequer on recurring basis. Even foreign exchange will be earned through the export of the products at some later stage. This will still be another source of addition to the foreign exchange of the country.

Employment opportunities arise from the installation of new project as well as incremental revenues will contribute not only to healthy salaries of existing employees but also uplift the general social and economic conditions of new work force.

5. Environmental Impact:

The technology suppliers/designers and fabricators enjoy international reputation. The boiler/s will be designed in a way that all sort of emissions from them meet the required levels of the NEQS Pakistan.

- **Noise levels:**

Since most of the machinery will be placed within the built up area thus ensuring noise level compliance with the required standards. Wherever necessary, double housing to the rattling parts of the machinery, is to be provided for reduction of noise levels. This is to be incorporated at the design stage of the plant. The maximum noise levels will not increase from 75 dB (A) during day time and 65 dB (A) during night time at the plant boundary thus will remain in compliance with the limits of the NEQSN Pakistan limits.

State of the art technology (if and wherever required) to reduce CO, NO_x and SO₂ and Particulate Matter (PM) emissions will be used. Hereunder, more details are given.

- **Boiler Stack Emissions**

Boiler stack emissions of concern are primarily nitrogen oxides (NO_x), carbon monoxide (CO) and particulate matter (PM) and sulphur dioxide (SO₂).

Since CO emissions are a function of plant operations such as the level of excess air and maintenance of combustion temperature and residence time, therefore, its concentrations can be easily controlled while controlling these factors.

- **Ash Handling**

The ash handling system envisaged for the cogeneration plant is of two types and shall be provided for two boilers individually:

- Sub-merged scrapper conveyor system for grate ash
- Cyclone Separator (Fly Ash Arrestor) for fly Ash

The fly ash from Cyclone Separator (Fly Ash Arrestor) will be dry and powdery in nature and occasionally with hot solids. Since the fly ash is to be collected through Cyclone Separator, therefore for the fly ash from the stack gas emission will be trapped in the system up to 99.9%. This ensures that the main emission of PM will be conveniently controlled to the desired levels as set by the NEQSAA.

The fly ash will be collected in storage yard having a suitable capacity & will be disposed-off by trucks / trailers suitably covered to avoid any spillage on the way. This ash may be disposed off according to any one of the following methods, individually of collected:

- Supply to cement factory. In case of using this method both fly ash and bottom ash can be mixed and disposed off together.
- Land fills. In case of using this method both fly ash and bottom ash can be mixed and disposed off together.
- For making bricks for face lifting,
- making bricks for paving
- Supply of the fly ash to agriculture use as rich source of Potassium, (K) being cheaper substitute of costly potassium fertilizer. It is to remember that since the ash comes from Bagasse an agree product therefore it will not harm to soil.

- **Bottom ash**

The furnace bottom ash is collected by water impounded scrapper conveyers, and as the quantity of ash discharge is less, the same is collected in trolleys parked near the scraper conveyor. The bottom ash of ash during transportation. This ash can be disposed of in variety of methods like:

- In cement as aggregate
- Manufacturing of tiles for face lifting of buildings, flooring of paths etc.
- Landfill

The figures given below are for the normal operation of the plant during the seasonal with Bagasse as the fuel.

- **Gaseous pollutants from the Cogeneration Plant during Bagasse firing.**

CO	350 mg/Nm ³
SO ₂	11.3 mg/Nm ³
NO _x	149.8 mg/Nm ³
PM	200.5 mg/Nm ³

- **Solid Wastes from the Plant during Bagasse firing**

Ash and Clinker	1.4 T/h
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- **Liquid Effluents**

a) <u>Boiler Blow down Water</u>	:	3.65TPH
Total Dissolved Solids	:	70-100 ppm (Max)
pH @ 25 Deg.C	:	9.8to 10.3
b) <u>Cooling Tower Blow down</u>	:	1 – 2 Cu.Mtr./Hr
Total Dissolved solids	:	1000 – 1200 ppm
pH @ 25 Deg.C	:	9.8to 10.6
Chlorine	:	N A
c) <u>Waste Water from water treatment</u>	:	10 TPH (average) Neutralizing pit
Total Dissolved solids	:	4500 ppm (Max.)
pH @ 25 Deg.C	:	7.81

- **SO₂ emissions**

After the plant startup, SO₂ emissions will be **11.3 mg/Nm³** as the sulphur content in the fuel is very less.

- **NO_x emissions**

After the plant startup, NO_x emissions will be **149.8 mg/Nm³** due to the very low level of nitrogen content in Bagasse. The maximum stack emissions of SO₂ and NO_x will not exceed the permissible limits of the NEQS Pakistan.

- **Particulate Matter (PM) emissions:**

Particulate matter emissions will be approximately **200.5 mg/Nm³** and will be controlled with Fly Ash Arrestor (Cyclone Separator) to remain within the prescribed limits of the National Environmental Quality Standards (NEQS)-Pakistan limits.

**ANNEX 16 – PROJECT INFORMATION IN PURSUANT TO SCHEDULE III
[REGULATION 3 (6)] FOR GENERATION FACILITIES**



16.1 PROJECT LOCATION AND SITE MAP

SITE LOCATION OF POWER PLANT & LAND MAP

Site Location

Power Plant will be installed at Shahtaj Sugar Mills, district Mandi Bahauddin. Shahtaj Sugar Mills situated at Khewa Mohabbat pur road near Kuthiala Syedan 4 Kilometers toward North – Western side from Mandi Bahauddin.

Link with GT Road (Lahore – Islamabad)

If we come from Islamabad on GT Road the turning Stop is Sarai Alamgir which is 50 kilometers away from Site. If we come from Lahore by GT Road the turning Stop is Gujrat which is 72 Kilometers away via Phalia lead to Site.

Link with Motor Way (Lahore – Islamabad)

If we come from Lahore the turning stop is Salam Interchange which is 61 kilometers from Site. If we come from Islamabad the turning Stop is Bhera Interchange which is 61 Kilometers from Site.

Railway Track

Railway track passage from Lala Musa to Sargodha is near the boundary line of Shahtaj Sugar Mills. Nearest Railway Station is Mandi Bahauddin which is 4 kilometers away from Site. Maps are attached here with for ready reference.

Land

Total Area of Shahtaj Sugar Mills is 485, 267 M².

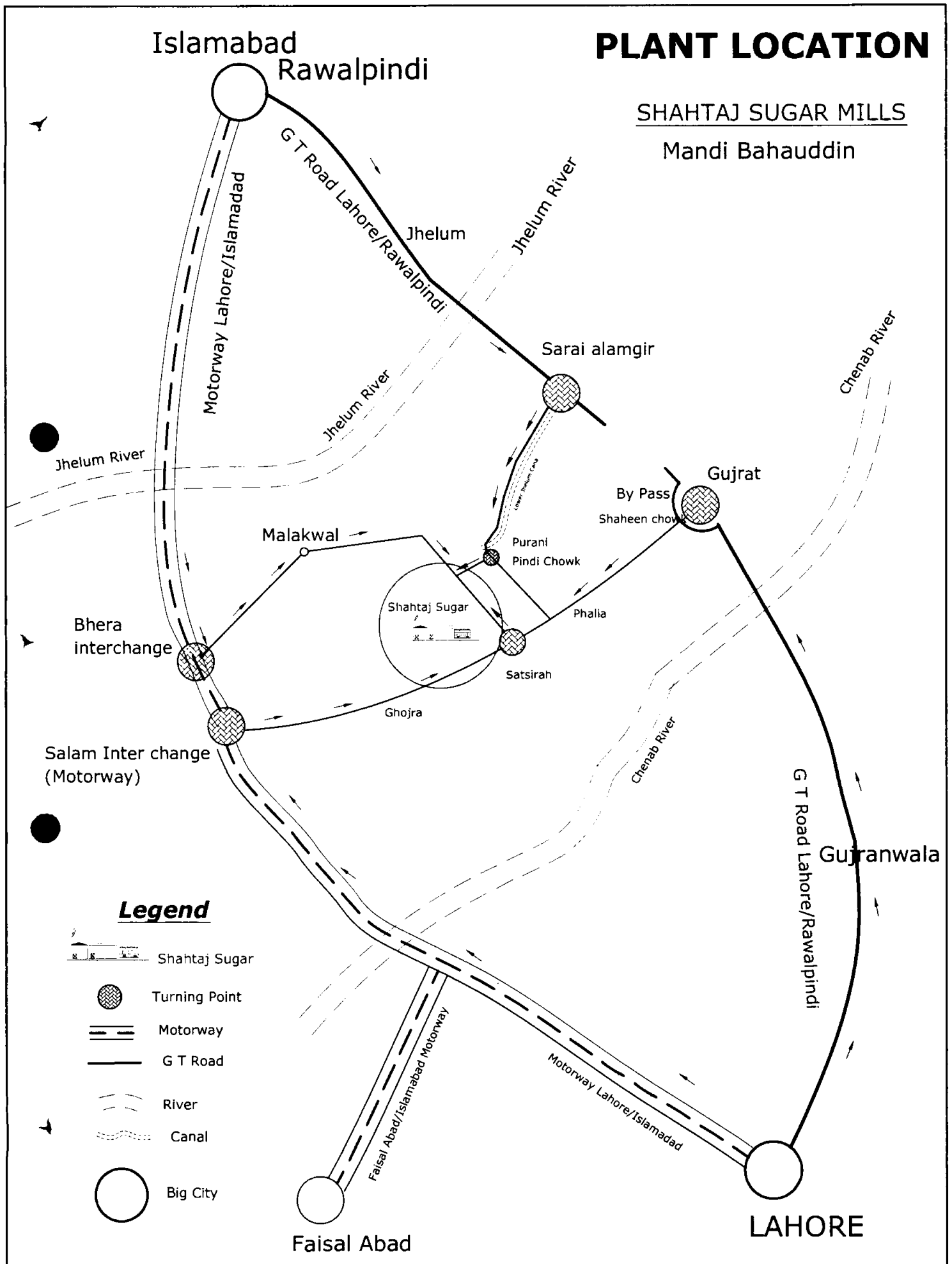
Factory Area	=	221, 586 M ²
Colony Area	=	263, 680 M ²

Site location Map and Land Map both are attached herewith for reference.

PLANT LOCATION

SHAHTAJ SUGAR MILLS

Mandi Bahauddin



Colony Area Sq.Mtrs.: 221586.9

Colony Area :- 221586.9 Sq.Mtrs.

Mill Area :- 263680.6 Sq.Mtrs.

Mill Area Sq.Mtrs.: 263680.6

Total Area Mill + Colony. =485267.5 Sq.Mtrs.





16.2 TECHNOLOGY, SIZE OF PLANT, NUMBER OF UNITS

(A). General Information

(i)	Name of Applicant/Company	Shahtaj Sugar Mills Limited
(ii)	Head Office	Head Office 72-C-1, MM Alam Road, Gulberg III, Lahore – 54660. Tel: +92-42-3571 0482-84 Fax: +92-42-357 11904
(iii)	Registered Office	19, Dockyard Road, West Wharf, Karachi - 74000 Tel: +92-21-32313934-38 Fax: +92-21-32310623
(iii)	Plant Location	Mandi Bahauddin - 50400 Tel: +92-546-501147-49 +92-546-508047-48 Fax: +92-546-501768
(iv)	Type of Generation Facility	High Pressure Bagasse Power Project

(B). Capacity and Configuration

(i)	Plant Size (MW)	15 MW Spill Over from Installed Power of 32 MW
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(C). Other Details

(i).	Project Commissioning date (Anticipated)	31 st January, 2017
(ii).	Expected Life of the Project from Commercial Operation date (COD)	20 Years

TECHNOLOGY

Bagasse and Other Bio Fuel Based Thermal Power Plant

High pressure boiler having the steam pressure 67 bar/Cm² will be install for steam generation. There after the high pressure steam will be used in steam turbo generator which will be compatible with the boiler steam pressure. Installed capacity of Power Plant will be 32 MW. During crushing season 15 MW and during Off Season 9.5 MW will be export to grid station at 11 KVA and then step up to 32 KVA for national Power Transmission line.

1) Fuel

- Bagasse and other Bio Fuel Based
After extraction of juice the fiber content in the cane is called Bagasse which is used as fuel in boiler for steam generation.

2) Size of Plant

- | | |
|-----------------------------|---------|
| - Power generation capacity | 32 MW |
| - Number of Steam Turbines | 02 Nos. |
| - Number of Boiler | 01 No. |

Specifications of Equipment

- | | |
|-----------------------------|--------------------------|
| 1. - Type of Turbine | Back Pressure |
| - Make | HTC China |
| - Model | 2016 |
| - Power | 16 MW |
| - Steam Pressure | 65 Bar / Cm ² |
| - Steam Temperature | 480 °C |
| 2. - Type of Turbine | Condensing Extraction |
| - Make | HTC China |
| - Model | 2016 |
| - Power | 16 MW |
| - Steam Pressure | 65 Bar / Cm ² |
| - Steam Temperature | 480 °C |
| 3. Boiler | |
| - Make | Descon |
| - Model | 2015 |
| - Capacity | 135 Ton/hr. |
| - Steam Pressure | 67 Bar / Cm ² |
| - Steam Temperature | 480 °C |



16.3

FUEL TYPE

Fuel for Power Plant

Bagasse

Fuel Type:	Indigenous (Bagasse)
Supplier:	Shahtaj Sugar Mills Limited
Logistics:	N/A
Pipelines:	N/A

After extraction of juice the fibrous residues of cane stalk is called bagasse. This bagasse is the primary fuel to be used in boilers for steam generations for the power plant. On the average, the composition of bagasse is:

- Moisture: 46-52% av 49%
- Fiber: 43-52% av 48.7%
- Soluble Solids: (Molasse Sugar) (av 2.3%)

The calorific value of bagasse is

- Gross calorific value: 2000 Kcal/kg
- Net calorific value: 1764 kcal/kg

Our estimated production of electricity, which is to be exported to National Grid, shall be produced from Bagasse available to us from crushing of sugarcane, which includes estimated 110 days of electricity production during season and 35 days during off-season. During season, we will not acquire Bagasse from outside sources. However, during off-season, the procurement of bagasse from difference sources would be considered based upon its economic viability.

Other Bio Fuels

Fuel Type:	Bio-Fuels (cane trash, cotton stick, mustard straw, rice husk)
Supplier:	To be evaluated
Logistics:	Trucks & Tractor Trollies
Pipelines:	N/A

The other Bio-Fuels viz. cane trash, cotton stick, mustard straw, rice husk etc. etc. can also be used independently but preferably mixed with the bagasse subject to their availability and economic viability.

1

2

3

4

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16.4 EMISSION VALUES

PROPOSED EMISSION VALUES:

SALIENT FEATURES:

Our power plant is based on bagasse which is environmental friendly fuel, this can be judged by the following facts:

- Sulphur (Sox) content is negligible rather non existence in bagasse.
- Similarly relatively low furnace temperature the nitrogen oxides (NOx) concentration in flue gases is very minimal.
- Boiler will be fully automatic and plenty of instrumentation and control equipment would be installed to control the emission of gasses. Owing to this the combustion in the boiler will be controlled resulting carbon monoxide content in emission gasses will be very much below the NEQA limits.
- Similarly the very latest technology will be used for the fly ash arresting thus the particular matters would be below the 500 mg/Nm³ limit.
- M/S Descon the proposed manufacturer of boiler have ensured us that the emission will be very well below the specific limits of all the parameters of NEQS.

MAJOR ASPECTS OF EMISSION:

The technology suppliers/designers and fabricators enjoy international reputation. The boiler/s will be designed in a way that all sort of emissions from them meet the required levels of the NEQS Pakistan.

- **Noise levels:**

Since most of the machinery will be placed within the built up area thus ensuring noise level compliance with the required standards. Wherever necessary, double housing to the rattling parts of the machinery, is to be provided for reduction of noise levels. This is to be incorporated at the design stage of the plant. The maximum noise levels will not increase from 75 dB (A) during day time and 65 dB (A) during night time at the plant boundary thus will remain in compliance with the limits of the NEQSN Pakistan limits.

State of the art technology (if and wherever required) to reduce CO, NO_x and SO₂ and Particulate Matter (PM) emissions will be used. Hereunder, more details are given.

- **Boiler Stack Emissions**

Boiler stack emissions of concern are primarily nitrogen oxides (NO_x), carbon monoxide (CO) and particulate matter (PM) and sulphur dioxide (SO₂).

Since CO emissions are a function of plant operations such as the level of excess air and maintenance of combustion temperature and residence time, therefore, its concentrations can be easily controlled while controlling these factors.

- **Ash Handling**

The ash handling system envisaged for the cogeneration plant is of two types and shall be provided for two boilers individually:

- Sub-merged scrapper conveyor system for grate ash
- Cyclone Separator (Fly Ash Arrestor) for fly Ash

The fly ash from Cyclone Separator (Fly Ash Arrestor) will be dry and powdery in nature and occasionally with hot solids. Since the fly ash is to be collected through Cyclone Separator, therefore for the fly ash from the stack gas emission will be trapped in the system up to 99.9%. This ensures that the main emission of PM will be conveniently controlled to the desired levels as set by the NEQSAA.

The fly ash will be collected in storage yard having a suitable capacity & will be disposed-off by trucks / trailers suitably covered to avoid any spillage on the way. This ash may be disposed off according to any one of the following methods, individually of collected:

- Supply to cement factory. In case of using this method both fly ash and bottom ash can be mixed and disposed off together.
- Land fills. In case of using this method both fly ash and bottom ash can be mixed and disposed off together.
- For making bricks for face lifting,
- making bricks for paving
- Supply of the fly ash to agriculture use as rich source of Potassium, (K) being cheaper substitute of costly potassium fertilizer. It is to remember that since the ash comes from Bagasse an agree product therefore it will not harm to soil.

- **Bottom ash**

The furnace bottom ash is collected by water impounded scrapper conveyers, and as the quantity of ash discharge is less, the same is collected in trolleys parked near the scraper conveyor. The bottom ash of ash during transportation. This ash can be disposed of in variety of methods like:

- In cement as aggregate
- Manufacturing of tiles for face lifting of buildings, flooring of paths etc.
- Landfill

The figures given below are for the normal operation of the plant during the seasonal with Bagasse as the fuel.

- **Gaseous pollutants from the Cogeneration Plant during Bagasse firing.**

CO	350 mg/Nm ³
SO ₂	11.3 mg/Nm ³
NO _x	149.8 mg/Nm ³
PM	200.5 mg/Nm ³

- **Solid Wastes from the Plant during Bagasse firing**

Ash and Clinker	1.4 T/h
-----------------	---------

- **Liquid Effluents**

a) <u>Boiler Blow down Water</u>	:	3.65TPH
Total Dissolved Solids	:	70-100 ppm (Max)
pH @ 25 Deg.C	:	9.8to 10.3
b) <u>Cooling Tower Blow down</u>	:	1 – 2 Cu.Mtr./Hr
Total Dissolved solids	:	1000 – 1200 ppm
pH @ 25 Deg.C	:	9.8to 10.6
Chlorine	:	N A
c) <u>Waste Water from water treatment</u>	:	10 TPH (average) Neutralizing pit
Total Dissolved solids	:	4500 ppm (Max.)
pH @ 25 Deg.C	:	7.81

- **SO₂ emissions**

After the plant startup, SO₂ emissions will be **11.3 mg/Nm³** as the sulphur content in the fuel is very less.

- **NOx emissions**

After the plant startup, NOx emissions will be **149.8 mg/Nm³** due to the very low level of nitrogen content in Bagasse. The maximum stack emissions of SO₂ and NOx will not exceed the permissible limits of the NEQS Pakistan.

- **Particulate Matter (PM) emissions:**

Particulate matter emissions will be approximately **200.5 mg/Nm³** and will be controlled with Fly Ash Arrestor (Cyclone Separator) to remain within the prescribed limits of the National Environmental Quality Standards (NEQS)-Pakistan limits.

16.5 COOLING WATER SOURCE

WATER SOURCE FOR POWER PLANT

Cooling water source required for two main purposes:

- High Quality water for HP Boiler
- Water for cooling of Turbine Oil Cooler and Cooling Tower.

High Quality water for HP Boiler:

High pressure boiler requires treated water @ 140 TPH which will be provided through R.O. and Polisher treatment plant supplemented by make-up techniques. Steam generated from the boiler will be used for dual purposes first it will be used in generation of electricity and then for the process of sugar mill for heating of juice. 70-75% of steam from sugar process is condensate in to water and again available for the use in HP Boiler rest of water around 25-30% will be available from the R.O and polisher treatment plant which will be provided through soil water pumped via tube wells.

Water for cooling of Turbine Oil Cooler and Cooling Tower:

Total water requirement for turbine oil cooler and cooling tower is around 4,200m³. This requirement will be initially satisfied through soil water from of tube wells installed in mills premises. (as can be seen in attached map.)

Loss of water for cooling purposes is estimated around 0.5% of total water required per hour (21TPH). This loss shall also be compensated through injection of soil water through pumping of tube wells.

Water Source:

Soil water pumped through tube wells is primary source of water for power plant.

Quantity:

2 No.

<u>Description</u>	<u>Capacity</u>	<u>Distance from Power Plant</u>
Tube Well #1	150m ³	190m
Tube Well #2	150m ³	129m

**16.6 INTERCONNECTION WITH NATIONAL GRID, NAME,
DISTANCE & SINGLE LINE DIAGRAM**

➤

INTERCONNECTION
ARRANGEMENT FOR DISPERSAL OF POWER FROM THE
PROJECT

The nearest Grid is 132 kV Mandi Bahauddin Station. The Interconnection of 15 MW Spillver to the GEPCO system (Gross 32 MW) is proposed by connecting 132 kV double circuit from Mandii Bahauddin approximately 8 km , using Rail conductor.

A separate Electrical and Grid Interconnection Study has been conducted for the Project including Power Quality, Load Flow, Short Circuit and Power Evacuation and submitted to NTDC for approval. A copy of Grid Interconnection Study is being provided with this application for reference.

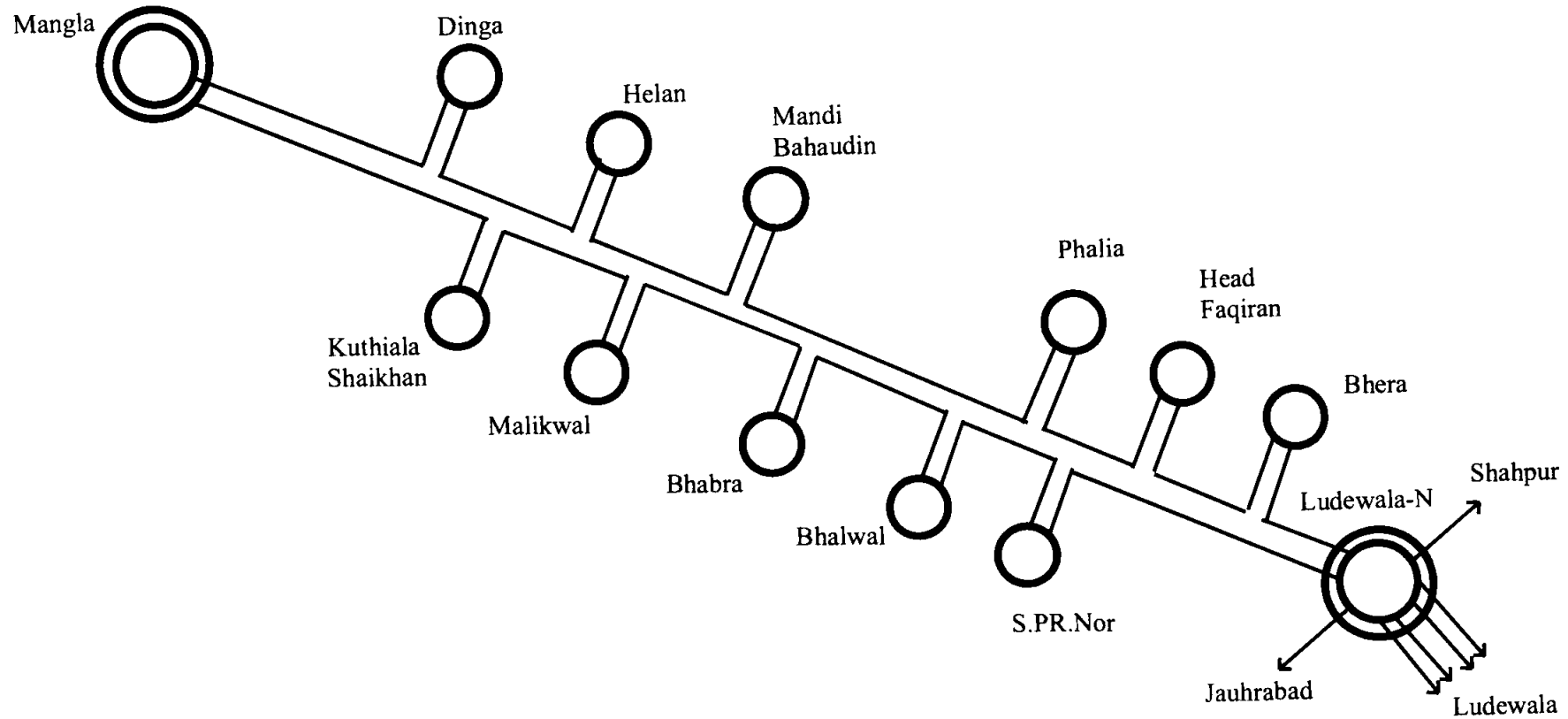
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132 kV Network Near Mandi Bahaudin Without Shahtaj Sugar Mills, Year Jan 2017



Legend

220 kV

132 kV

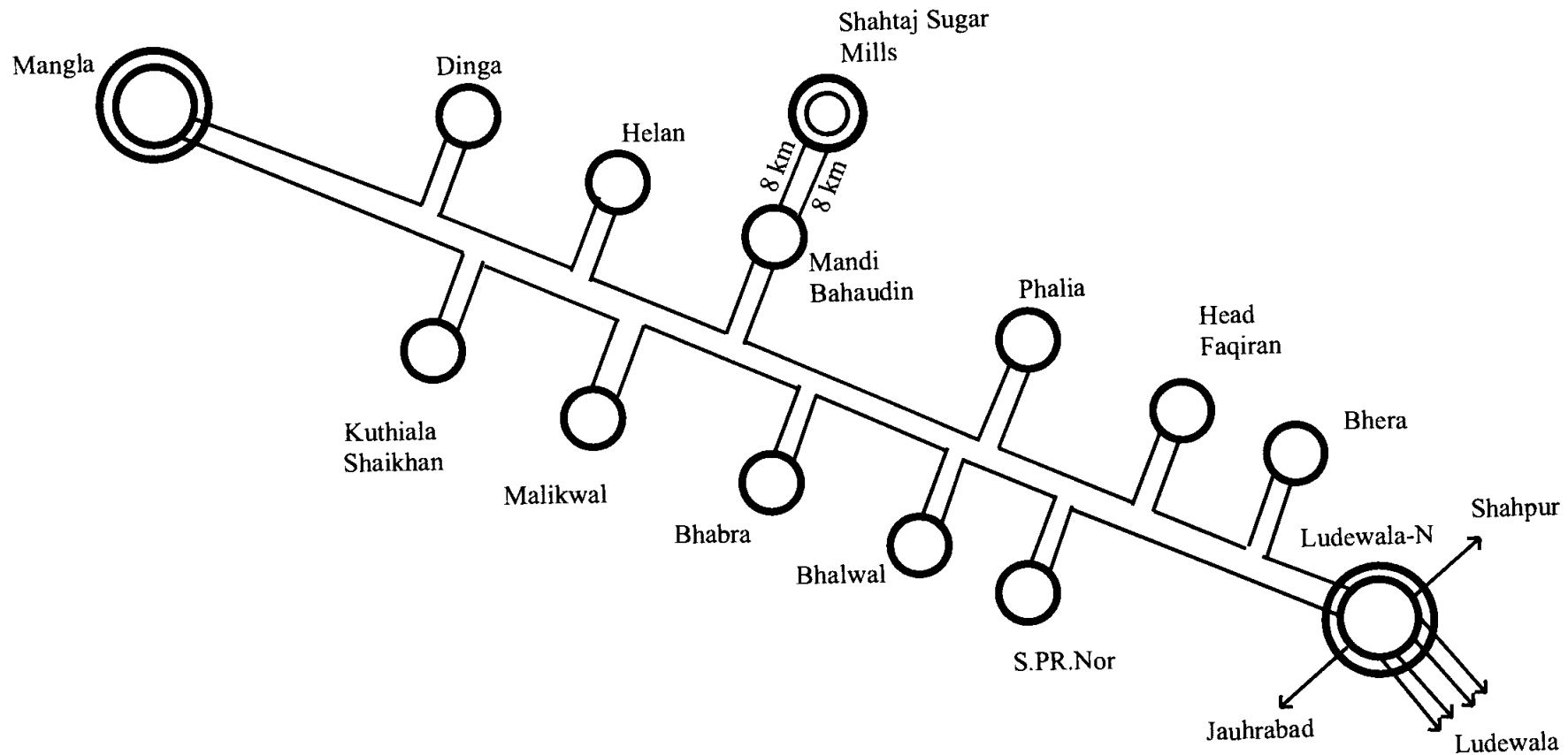
SLD - I

STUDY OF INTERCONNECTION OF
132 KV NETWORK NEAR MANDI BHAUDIN
WITHOUT SHAHTAJ SUGAR MILLS, YEAR JAN 2017

POWER PLANNERS INTERNATIONAL
64 PI WARDA TOWN LAHORE

PREPARED BY: PPI	RECOMMENDED	PER./CHK.	APPROVED.
DWN			
FILE	DATE	DRAWING NO.	REV.
CHKD	NOV. 2016	FIG - 001	0
SUBM.			

132 kV Network Near Mandi Bahaudin With Shahtaj Sugar Mills, Year Jan 2017



Legend

220 kV	_____
132 kV	_____
Proposed 11 kV	_____
Proposed 132 kV	_____

SLD - II

STUDY OF INTERCONNECTION OF
132 KV NETWORK NEAR MANDI BHAUDIN
WITH SHAHTAJ SUGAR MILLS, YEAR JAN 2017

POWER PLANNERS INTERNATIONAL
64-FI WAPDA TOWN, LAHORE

PREPARED BY	PCP	RECOMMENDED	VER./CHK.	APPROVED
DRN				
FILE				
CHKD		DATE	DRAWING NO.	REV.
SUBM		MAR 2016	FIG - 002	0

**16.7 INFRASTRUCTURE: ROAD, RAILS, STAFF COLONY
AMENITIES**

INFRASTRUCTURE, ROADS, RAILWAY, STAFF COLONY AND AMENITIES

Infrastructure

Total area of Shahtaj Sugar Mills is 485, 267 M². This area divided in to 02 main portions Factory and Residential Colony:

Factory

Area covered by Factory is 221, 587 M². This area divided in to following portions:

- 1) Cane Yard
- 2) Cane Offices
- 3) Admin. Block
- 4) Cane unloading area
- 5) Mill House
- 6) Boiler House
- 7) Process House
- 8) Power House
- 9) Work Shop (Mechanical Work Shop & Transport Work Shop)
- 10) Sugar Godown
- 11) Bagasse Yard
- 12) Area for Gardening & grassy Plots

Residential Colony

Area of residential Colony is 263, 680 M². This area divided in to following portions:

1. Resident Director House
2. A-Type Residence for Senior Officers (16 Nos. Houses)
3. B-Type Residence (11 Nos. Houses)
4. C-Type Residence (14 Nos. Houses)
5. D-Type Residence (42 Nos. Houses)
6. E-Type Residence (22 Nos. Houses)
7. SMR (Single Manager Residence)
8. SOR (Single Officer Residence)
9. SSR (Single Supervisor Residence)
10. Officers' Club (Choapal)
11. Shahtaj Model High School for Girls
12. Play Grounds (Football Ground, Basketball, Badminton, Tennis Courts etc.)
13. Children's Park

Roads

Power Plant will be installed at Shahtaj Sugar Mills, district Mandi Bahauddin. Shahtaj Sugar Mills situated at Khewa Mohabbat pur road near Kuthiala Syedan 4 Kilometers toward North – Western side from Mandi Bahauddin.

Link with GT Road (Lahore – Islamabad)

If we come from Islamabad on GT Road the turning stop is Sarai Alamgir which is 50 kilometers from Site. If we come from Lahore on GT Road the turning stop is Gujrat which is 72 Kilometers via Phalia lead to Site.

Link with Motor Way (Lahore – Islamabad)

If we come from Lahore the turning stop is Salam Interchange which is 61 kilometers from Site. If we come from Islamabad the turning Stop is Bhera Interchange which is 61 Kilometers away from Site.

Railway Track

Railway track passage from Lala Musa to Sargodha is near the boundary line of Shahtaj Sugar Mills. Nearest Railway Station is Mandi Bahauddin which is 4 kilometers away from Site. Maps are attached here with for ready reference.

**16.8 PROJECT COST, INFORMATION REGARDING EQUITY
AND DEBT**

PROJECT COST AND SOURCES OF FINANCE

1. INTRODUCTION:

Shahtaj Sugar Mills Limited was incorporated in 1965 as a public limited company and listed on both Karachi and Lahore stock exchanges. The company had started its commercial sugar production in 1967 and since then engaged in this business with a distinct name in the sector. Currently it holds 10,000 TCD crushing capacity. Molasses is the only significant by-product contributing the company's revenues

The company is one of the group companies of the shahnawaz group, which is a local conglomerate operating in diversified industries including automobile, sugar, textile, manufacturing, food and beverages, information technology.

SSML is one of the most accredited sugar manufacturers in Pakistan. Credit worthiness can be judged by the fact that SSML had never defaulted in payments towards its growers, suppliers and financial institutions. Market standing can also be contemplated by the fact that SSML sugar selling rate remains always higher among all other sugar mills in Punjab.

2. PROPOSED INVESTMENT FOR THE PROJECT:

<u>Estimated Project Cost</u>	%	Amount (Rs in millions)
EPC Cost	81.2%	2,138.18
Non-EPC Cost	18.8%	493.99
Total	100%	<u>2,632.17</u>

Means of Financing

Developer's Equity	20%	526.44
Bank Loan (Local)	80%	2,105.73
Total	100%	<u>2,632.17</u>

3. SOURCES OF FINANCE:

As shown in the above table the total project cost is estimated at PKR 2,632.2m. EPC cost constitutes 81.2% of the total project cost. Non-EPC cost is inclusive of IDC and project financing.

As shown in the adjacent table, proposed project is to be financed through a combination of debt and equity. The long term debt financing is going to be finalized through syndicated term facility from MCB bank which will account for almost 80% of the project cost.

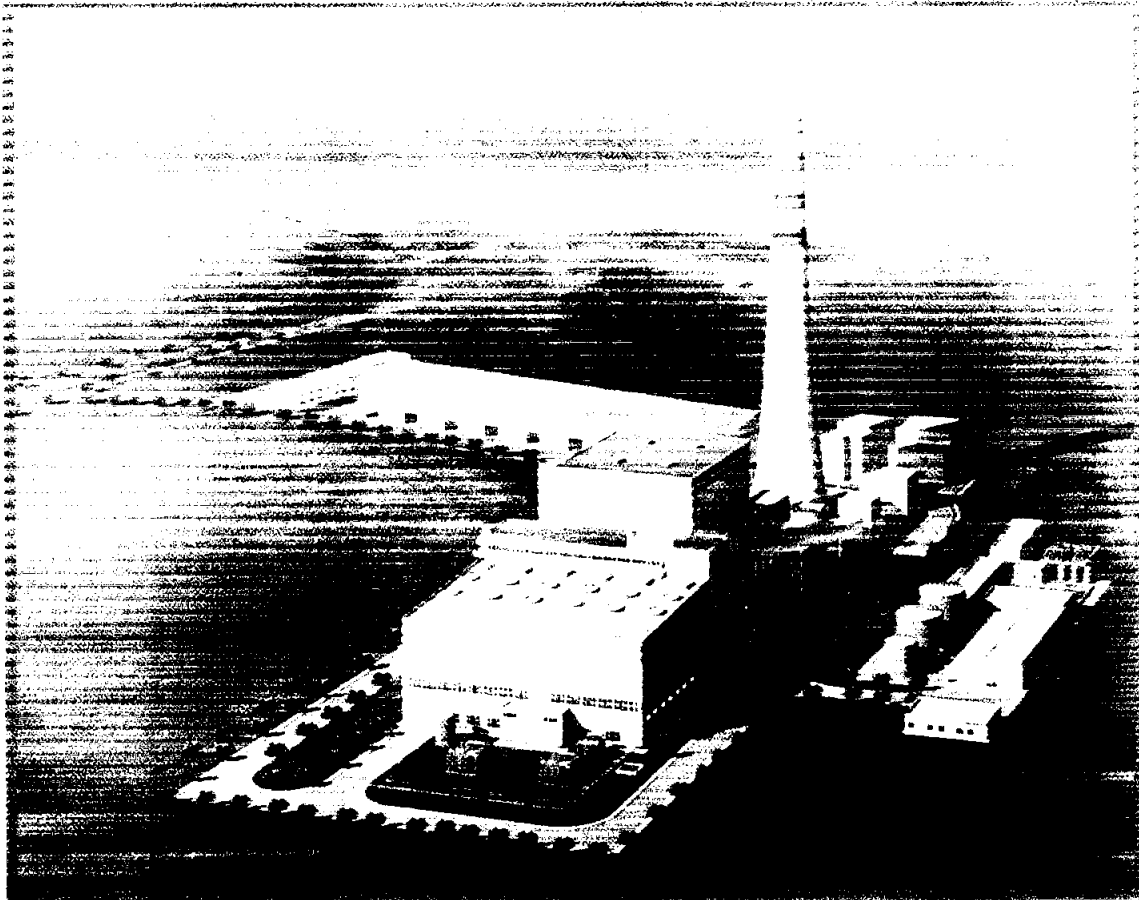
The remaining 20% of the project cost that is PKR 526.4m is proposed to be contributed by SSML. Further, the equity contribution or investment is proposed to be injected as and when required in accordance with the financing arrangements to be agreed with the potential lenders, however the probable form of equity injection might be:

- Direct cash injection.
- Civil and other work done by SSML from its own sources
- Allocation of assets, land and other sources.
- Any other form as deemed appropriate.

**16.9 PROJECT COMMENCEMENT AND COMPLETION
SCHEDULE**

Activity / Milestone	2015	2016	2017
LOI awarded	Sep, 15		
Submission of Grid Interconnection Study to NTDC	Sep, 15		
Submission of ICE Report to EPD Punjab	Sep, 15		
Approval of ICE Report from EPD Punjab		May, 16	
Approval of Grid Interconnection Study by NTDC		Jun, 16	
Submission of Upront Tariff and Generation License Application to NEPRA		Jun, 16	
Approval of Upront Tariff and Generation License Application by NEPRA		Aug, 16	
Issuance of LOS		Aug, 16	
Submission of EPA Draft to NTDC		Jun, 16	
Negotiations and Signing of EIA		Oct, 16	
Signing of IA		Oct, 16	
Financial Close		Nov, 16	
Project COO			Jan, 17

Pre-Feasibility Report



**A Renewable Energy Bagasse and other Bio Fuel Based
Thermal Power Plant
Production Capacity of 32MW/Hr**



TECHNICAL CONSULTANTS

ENGINEERS, ARCHITECTS & EQUIPMENT SUPPLIER

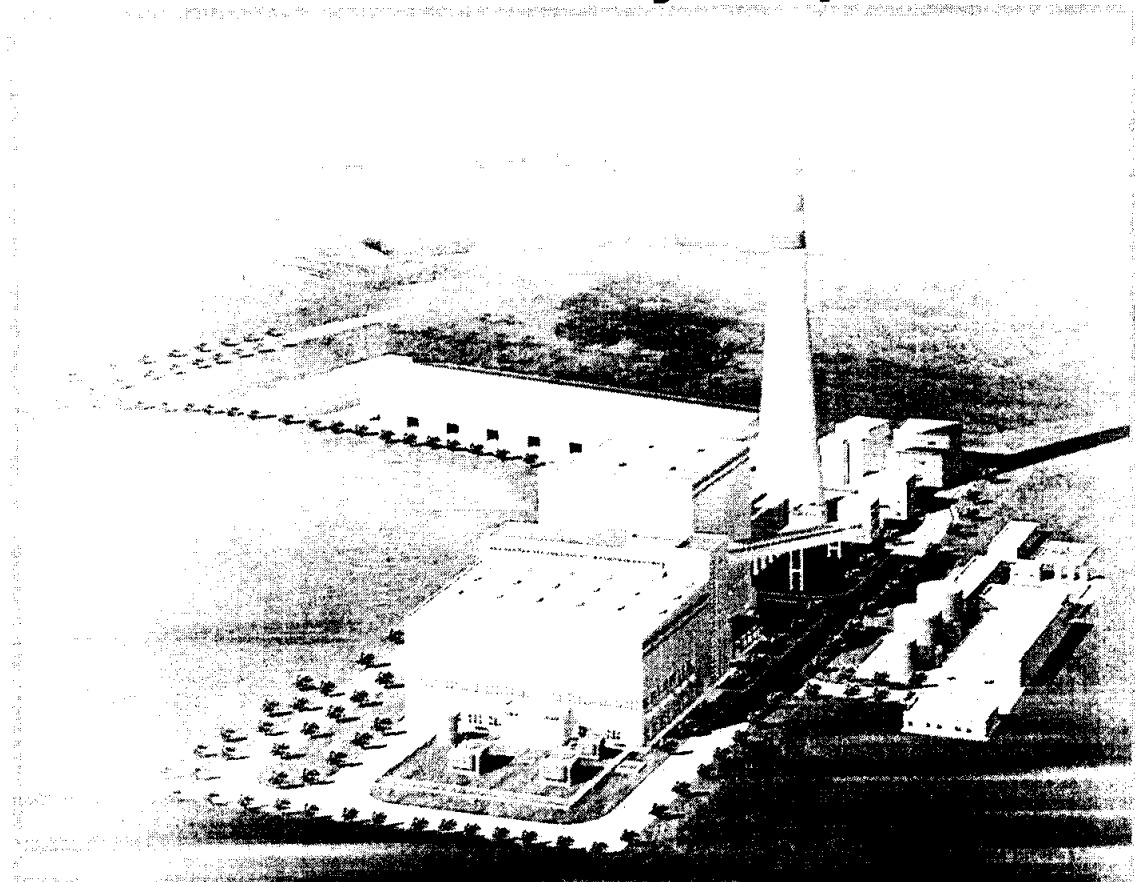
Plot No. 18, Sector 18, Gurgaon, Haryana - 122002, India

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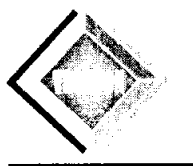
Email: info@technicalconsultants.co.in

Project No. TC/18/2013
(Revised) May 18, 2013
Project Name: Shahtaj Sugar Mills

Pre-Feasibility Report



**A Renewable Energy Bagasse and other Bio Fuel Based
Thermal Power Plant
Production Capacity of 32MW/Hr**



TECHNICAL CONSULTANTS

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Project No. TC/17/2013
May 18, 2013 (REVISED)
Project Name: Shahtaj Sugar Mills

Pre Feasibility Report

**A Renewable Energy Bagasse and other Bio Fuel Based
Thermal Power Plant
Production Capacity of 32MW/Hr**

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1. Product, Production Capacity and Its Basis

This Pre feasibility is prepared on the basis of discussion / basic requirements and information provided by the Resident Director, SHAHTAJ SUGAR MILLS LTD and his team members.

The proposed power plant shall provide Electric Power to Shahtaj Sugar Plant any surplus/excess electric power will be given to DISCO.

1.1 Basic Assumptions

The Electric Power production is based on high steam pressure in two phases. This project is based on 1st phase and will produce 22.90MW from the available fuel bagasse. After use of electric power in Shahtaj Sugar Mills and self power consumption of power plant the excess power equal to 15.90MW will be given to DISCO.

Based on alternate energy of bagasse on high pressure of 67Kg/Cm² at 485C temperature, power plant will operate at higher efficiency. This will save bagasse fuel during 110days of cane crushing season, power plant can operate in off-season on this saved bagasse for approx. 35day.

The power supply to DISCO shall be 15,90kW during season (110 days) and 9.5 MW during off-season (35 days). The in-house power consumption of proposed power plant shall be 1.90MW approx and electric power for sugar plant shall be 5150kW. Therefore, the selected power plant capacity shall be 32MW. (Detail is given in Annexure-A). Electric Power produced will be 22850kW.

1.2 Selection of Fuel and Parameter for Electric Power Generation

The proposed power plant shall consume renewable energy bio fuel (sugar cane bagasse, rice husk, sugar cane trash, mustard straw, cotton sticks, corn cobs etc.). Furnace oil shall only be used for startup of boiler and to meet any contingency.

2 Process/Technical Description

Technical Scheme

The technical scheme is made according to the above available information and the precondition that the proposed power plant will supply electric power to Shahtaj Sugar Mills and surplus power shall be given to DISCO.

2.1 General

One Bio-fuel fired spreader stoker type boiler will be installed at the proposed site and will be capable to meet the steam requirement for power generation of 22.90MW. The 19MW Extraction Condensing Turbine and 19MW Back Pressure Turbine will be selected for the power plant. The normal continuous power generating capacity will be 22.90MW. For starting up the power plant and making power supply safe and reliable, existing facility of sugar plant will be used. Steam balance is attached as per drawing No.TC-01-0003-00 and TC-01-0004-00.

All auxiliary equipment, water treatment facility, fuel handling equipment, cooling water circulating facility, power distributing equipment for power plant, lighting and lightening/earthing device, DCS control and communication system are considered.

2.2 Bio Fuel Fired Boiler

Selection of boiler and turbo generators are for high pressure steam (67Kg/Cm²) and 485°C temperature for efficient/economical operation.

The boiler should be spreader stoker type bio-fuel fired, having single drum connected with tubes through distribution headers.

Boiler should be designed for bio fuel (bagasse, rice husk, sugarcane trash, mustard straw, cotton sticks, corn cobs etc.) and furnace oil firing. Furnace oil should be fired through guns and bio fuel to be introduced in furnace through variable speed feeders. Light particles of fuel burn in suspension in the chamber whereas, heavy particles, burn on the grate. Hot air heated through air heater is sent for burning the fuel. To create negative draught of air in the chamber induced draft fan suck the flue gasses and sends the gasses to chimney, through dust control equipment. Steam from steam drum, be super heated and sent to steam distribution header. Boiler should be complete with steam drum, headers, main tube bank, super heater, economizer, air

preheater, boiler grate, ID, FD and SA fans, dust control system, boiler feed water pumps, DCS control system and electrical system. Main parameter should be:

Boiler capacity NCR	135 t/hr
Steam Pressure	67Kg/Cm ²
Steam Temperature	485±5°C
Boiler feed water temperature	115°C

2.3. Turbines (Extraction Condensing Type and Back Pressure Type)

- a- One back pressure turbo generator of 16MW with 5.79Kg/kWhr is being installed with back pressure steam to be used in sugar processing. This turbo generator will be used during sugar cane crushing season.
- b- Extraction condensing type turbo generator of 16000KW should be selected to generate electric power and extraction of process steam for the plant. This turbo generator will be used both during season and also in off-season.
- c- Steam from boiler to be sent to both turbo generators. Turbines should be multi-stage and one extraction condensing type second back pressure type, coupled with generator through gearbox. Steam turbine should have following configuration.
- d.1 Extraction Condensing Turbine

Specific steam consumption at 0 extraction shall be 3.85Kg/kWh and Electric Power 16.0MW. Steam extraction shall be 70.21tons/hr at 1.5Kg/Cm²g pressure, whereas specific steam rate shall be 5.37Kg/kWh power generated will be 16MW.

Proposed turbo generator requires condenser and water circulation system, which should be of approx 3000M³/Hr capacity.
- d.2 Back Pressure Turbine

Back pressure turbine will produce 16MW and consume 82.20t/hr steam

2.3.1a Turbine Extraction Condensing (16000 KW):

Quantity	1set
Main feeding steam max. flow rate at 0 t/h Extraction	61.72 t/h
Nominal temperature	470 °C
Nominal pressure	65 Kg/Cm ²
Power Produce	16 MW
Steam condensed	10.5 t/hr

Steam flow rate	86.03 Ton/h
Steam Extraction	70.21 Ton/h
Steam to condenser	15.82 Ton/h

2.3.1b Accessories

Electric centrifugal pump, electric gear pump, DC gear pump oil cooler, oil tank, air bleeder, condenser, low pressure heater, pressure equalizer, sealing steam heater, trap tank, instruments and valves, high pressure heater etc.

2.3.2a Turbine Back Pressure (15000 KW):

Quantity	1set
Main feeding steam max. flow rate	92.2 t/h
Nominal temperature	470 °C
Nominal pressure	65 Kg/Cm ²
Back Pressure	1.5 Kg/Cm ²
Rated power produced	16000 KW

2.3.2b Accessories

Electric centrifugal pump, electric gear pump, DC gear pump oil cooler, oil tank, air bleeder, condenser, low pressure heater, pressure equalizer, sealing steam heater, trap tank, instruments and valves, high pressure heater etc.

2.4a Generator for Extraction Condensing Turbine

Quantity	1 Set
Rated power produced	16000 KW
Rotaty speed	1500 R.P.M
Outlet voltage rating	11KV
Power factor	0.8
Attaching devices	brushless exciter, air cooler and proper electrical controlling device

2.4b Generator for Back Pressure Turbine

Quantity	1 Set
Rated power produced	16000 KW
Rotaty speed	15000 R.P.M
Outlet voltage rating	11KV
Power factor	0.8
Attaching devices	brushless exciter, air cooler and proper electrical controlling device

2.5 Induced Draft Fan Two sets Primary Forced Draft Fan Two Sets and Secondary Force Draft Fan for Boiler.

Quantity	2+2+1
Capability	2x3600 & 1684 & 672 Nm ³ /min
Pressure	29.2mbar, 27mbar and 58mbar

2.6 Dust Cleaning Devices for Boiler (Soot Blowing and Dust Collection)

2 sets of extendable steam blowing dust/soot cleaner and 2 sets of rotary type dust cleaning device for boiler.

Fly ash and dust collected is disposed with rake or chain conveyors. Flue gas is sent to chimney. Multi cyclone type dust collecting system to be provided.

2.7 Blow Down Expansion Tank

Continuous boiler blow down expansion tank

Quantity	1 set
Capacity	2.5 m ³

2.8 Water Pumps

Boiler feed water pump

Quantity	2
Capacity	150-160t/h
Pump lift	850 mWC
Working temperature	125 C

2.9 Condensate Water Pump after Steam Trapping Tank

With condenser of Ext. Cond. turbine

Quantity	2
Capacity	60 t/h
Pump lift	84~68 mWC
Working temperature	60 °C

2.10 Ejector Pumps for Turbine (Ext. Cond. Type)

Quantity	2
Capacity	80-120 t/h
Pump lift	54~48 mWC
Working temperature	60 °C

2.11 Condensate Pumps for Turbine (Ext. Cond. Type)

Quantity	2
Capacity	60-70 t/h
Pump lift	54~48 mWC
Working temperature	60 °C

2.12 Cooling Water Circulating Pump (Ext. Cond. Turbine)

Quantity	3
Capacity	1600-1800 t/h
Pump lift	26~18 mWC
Working temperature	normal temperature

2.13 Water Treatment and Cooling Facility

Valve less filtering device

Quantity	2
----------	---

2.13.1 Cooling tower

Quantity	1
Cooling water flow rate	3000 t/h
Inlet water temperature	43 °C
Outlet water temperature	32 °C

2.13.2 RO Type Demineralized water plant

Quantity	1
Capacity	50 t/h

2.13.3 Fine sand filter

Quantity	1
Size	Ø1500 mm
Flow rate	60-70 t/h
Working pressure	4Kg/Cm ²

2.13.4 RO Plant

Complete Reverse Osmosis water treatment system with back wash pump chemical dosing pump and feeding pump.

Capacity	50t/hr
----------	--------

2.13.5 Mixed Bed Polisher Ion Exchanger

Quantity	1
Size	Ø1500 mm
Flow rate	60-70 t/h
Working pressure	4Kg/Cm ²

2.13.6 Carbon dioxide remover

Quantity	1
Size	Ø1500 mm
Flow rate	60-70 t/h
Working pressure	4Kg/Cm ²
Attachment tank	10 m ³

2.13.7 Hydrochloric acid container

Quantity	1
Hydrochloric solution	36%
Concentration	
Capacity	10 m ³
Attachment	all auxiliaries

2.13.8 Alkali solution container

Quantity	1
Alkali solution	40%
Concentration	
Capacity	10 m ³
Attachment	all auxiliaries

2.13.9 Water pump

Quantity	2
Capacity	15~30 t/h
Pump lift	30-34mWC
Working pressure	normal temperature

2.13.10 Acid pump

Quantity	2
Capacity	7.5~15~20 t/h
Pump lift	30-34mWC
Working pressure	normal temperature

2.13.11 Caustic Soda Pump

Quantity	2
Capacity	7.5~15~20 t/h
Pump lift	30-34mWC
Working pressure	normal temperature

2.14 Other Auxiliary Devices

2.14.1 De aerator

Quantity	1
Capacity	170t/h
Working pressure	0.2Kg/Cm ²
Working temperature	115 °C
Attach water tank volume	60 m ³

2.14.2 Double beam crane

Quantity	1
Span	20m
Lifting height of main hook	12m
Lifting height of auxiliary hook	12m
Lifting capacity of main hook	25t
Lifting capacity of auxiliary hook	5t

2.15 Electrical Equipment

2.15.1 High tension switch cabinet

Quantity	3
Voltage	11 kV
Size	1200x800x2100 mm

2.15.2 Low tension switch cabinet

Quantity	4
Voltage grade	0.4/0.23 kV
Size	1200x800x2100 mm

2.15.3 Power transformer

Quantity	2
Capacity	1500 KVA
Prime voltage	11 kV
Secondary voltage	400/230V

2.15.4 Operating console

Quantity	2
Size	1600x1, 200x800x2100 mm

2.15.5 Tie bus cabinet

Quantity	1
Size	1000x800x2100 mm

2.16 Main Automation Equipment

2.16.1 Protection signal and relay panel

Quantity	1
Size	1000x800x2100 mm
Capacity	120 Ah

2.16.2 Intelligent pressure transmitter

Quantity	12
Scale	-0.1~10Mpa
Output signal	4~20mA

2.16.3 Intelligent pressure-differential transmitter

Quantity	3
Scale	$5 \times 10^3 \sim 196 \times 10^3$ Pa
Output signal	4~20mA

2.16.4 Flow measuring orifice

Quantity	2
----------	---

2.16.5 Thermal resistance and thermo Couple

Quantity	25
Scale	normal temperature~1100 °C
Output signal	4~20mA
Shell material (if any)	stainless steel

2.16.6 Distributing control system (Siemens, ABB Or equivalent)

Quantity	1set
Number of analog signal	60
Number of on-off signal	50
Number of monitor	2
(100% redundancy)	

2.17 Selection of Fuel

Due to its in-house availability, we considered bagasse for the purpose of making feasibility report (refer to Annex-B for detailed calculations). However, other renewable energy bio fuels e.g. rice husk, cotton sticks, corn cobs, sugarcane trash, mustard straws) can also be used.

We give the quantity of fuel required on 100% firing of bagasse for the generation of 135tons steam to produce 22.90MW electric power.

Bagasse required to generate	
135tons steam	58.7t/hr

2.19 Steam Required from Bio -Fuel to Generate 22.85MW

Steam required	135000Kg/hr
Steam pressure	67Kg/Cm ²
Steam temperature	485°C

2.20 Electric Power Generated Through Extraction Condensing Turbo Generator

Power generated @ 6.0Kg/Kwh during season	6.9MW
Extraction Steam at 1.5Kg/Cm ² g during season	27,500Kg/hr
Power generated @ 4.17kg/kWh during off-season	11390kW
Extraction at 1.5Kg/Cm ² g during off-season	5000Kg/hr

2.21 Electric Power Generated Through Back Pressure Turbo Generator

Power generated during season @ 5.76Kg/kWh	16000kW
Back pressure steam during season	92.2Ton/hr

2.22 Self Power Consumption of Power Plant (During season)

Installed power of boiler	1864kW
@ 75% load on motors	1398 \approx 1400kW
Installed load of TG and Water Circulation	600kW
@ 75% load on motors	450kW
Total Load Aprox	1850kW

3. Site Condition, Specification of Raw Material and Utilities

3.1 Site Conditions

Water supply Source	well water
Capacity	sufficient for power plant
Site elevation	400 m above sea level
Maximum dry bulb temp.	50°C
Minimum dry bulb temp.	0°C
Maximum wet bulb temp.	34°C
Minimum wet bulb temp.	5°C

3.2 Seismic Conditions

Seismic factor at ground level in the free field condition is Richter Scale 7.

4. Design Data / Technical and Economical Index.

4.1 Table of Design Data and Actual Demand

Index		Design Figure
Generating capacity	Normal 15 + 7.85	22.85 MW
Average power supply	(Self Power 1.85MW of Power Plant)	21 MW
Annual running hours	Boiler (110 days season 35days offseason)	145 Days
	Power plant	145 Days
Annual power generated (22,850x24x110 + 11,380x24x35) (Season + Off Season)		69,884,000 kWh
Annual power supplied (21,000x24x110 + 9,500x24x35) (Season + Off Season)		63,420,000 kWh
Self power consumption of power plant (1.85x24x110 + 1.88x24x35) (Season / Off Season)		6,463,000 kWh
Power supplied to Sugar Plant (@ 5.15MWx24x110) (Season)		13,596,000kW
Power supplied to DISCO (15.85X110X24 + 9.5X24X35) (Season + Off Season)		49,824,000kW
Life time of equipment	Boiler	30 years (operational)
	Turbine	30 years (operational)
	Generator	30 years (operational)
Influence on plant production by power plant construction on existing installation		No effect new plant

Remark: The figures listed in above table are assumed

4.2 Material Consumption

A- Purchased Directly.

Material	Annual Output/Consumptions	Unit Cost Rs.	Total Rs.
Water expenses 40t/Hr	139200 ton	Rs.5/ton	696,000
Wages of employees: (Workers & Management)	47 persons	Rs.300,000/person/year	14,100,000
Chemicals			
40% NaOH (7.5kgx24x105)	26.1ton	Rs.25,000./ton	652,500
35% HCl (7.5kgx24x145)	26.1ton	Rs.20,000./ton	522,000
98% Na ₃ PO ₄ -12H ₂ O (5kgx24x145)	17.5ton	Rs.30,000./ton	525,000
Chemicals for circulating water			
Ammonia	1.75ton	Rs.300,000./ton	525,000
	1.75ton	Rs.40,000./ton	70,000
Maintenance Total	69,884,000 kWh	Rs.0.02 kWh	1,398,000
Lubricant Total	69,884,000 kWh	Rs.0.015./kWh	1,048,000
			19,536,000

Remarks: The figures listed in above table are assumed.

B- Purchased from existing processing unit.

Purchased from existing processing unit				
Condensate		125x0.8x24x110	Rs.6	1,584,000
Bagasse (165372tons)	During season	56.5x24x110 = 149160	Rs.2500	413,430,000
	During off season	19.3x24x35 = 16212		
TOTAL A+B				Rs.434,550,000

5. Personnel Requirement

5.1 Management Personnel

Normally to run such a power plant, altogether four management personnel, among which one plant chief, and three engineers (1 boiler engineer, 1 electrical engineer and 1 automation engineer) are included.

5.2 Operators and Workers

Total 47 staff members (including managers, supervisors, operators and technicians) are required to run the plant.

Supervisors/workers are divided into four groups. 3-shifts/day system will be adopted and the four groups will be on duty one by one. Working time for each shift will be 8 hours. In consideration of the power plant as captive power plant of the factory, maintenance and repair work could be done by the personnel of existing workshop. In this personnel plan, maintenance personnel are not considered.

The requirement of the workers is listed below:

Working Post	Number of Workers				Remark
	Group A	Group B	Group C	Group D	
Boiler supervision	1	1	1	1	
Boiler operating	3	3	3	3	
Chemical analyzing	1	1	1	1	
Water treatment	1	1	1		
Electrical technician	1	1	1	1	
Power system inspecting	1	1	1	1	
Automation technician	1	1	1	1	
Other/helper	2	2	2	2	
Sub-total	11	11	11	11	

6. Master Schedule

Year Months	1 st Year												2 nd Year											
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
1-Basic Engineering																								
2-Detailed Engineering																								
3-Civil Work																								
4-Machinery, Equipment, Material																								
5-Installation & Erection																								
6-Piping & Insulation																								
7-Instrumentation																								
8-Electrical																								
9-Commisioning																								
10-Start Up																								
11-Production																								

Remarks: Activity starts from date of LC opening/ first payment

7. Plant Performance Test Parameters

7.1 Guarantee Figures

- 7.1.1 Within continuous 72 hours, the power generated by the whole power plant shall be
- a. 16000kW for back pressure TG and 16000kW for Ext. Cond. TG at 0t/hr Ext. & 7850kW at 37.5t/hr Ext.
- 7.1.2 The capacity of the power plant shall be 22.90 MW. (NCR)

7.2 Pre Condition for Carrying Out Plant Performance Test

The following pre conditions are required to be fulfilled while carrying out power plant performance test.

- 7.2.1 The whole plant is running under full capacity, i.e. boiler steam generation out put shall be 132tons/hr and power generation shall be 16000kW and 7850kW.
- 7.2.2 The parameter of the steam coming from boiler at the outlet should be 67Kg/cm² and 485°C as minimum temperature.
- 7.2.3 The water supplied for the power plant shall be clean, and pH value shall be within the range of 7~7.5, and the supply is sufficient.
- 7.2.4 The maximum dry bulb temperature shall be less than 45°C and wet bulb temperature shall be less than 32°C.
- 7.2.5 All the managing staff, technicians and operators shall be qualified, competent for their respective jobs and fully trained.

8. Project Investment

8.1 Investment Estimation and Economical Evaluation

This brief economic study worked out is based on the basic data and information provided by the client. Only 8% taxes levied on the imported goods are considered when making calculation for imported equipment.

The power plant will be equipped with locally manufactured 135tons/hr multi-fuel boiler, Imported 16MW back pressure turbo generator and 16MW Ext. Cond. Turbo Generator with auxiliary plant for power house. The annual power generated will be considered as 69,884,000 kilowatt-hours, while the annual power supplied is 63,420,000 kWh. This power shall be available for use out of which 13,596,000kW will be supplied to Sugar Processing and 49,824,000kW shall be supplied to **DISCO**.

For selling to **DISCO** 11KV electricity will be supplied where it can be step up by **DISCO**, for its onward distribution. Calculation is given in **Annexure-C**.

Power generated at 11KV will be distributed in sugar plant by step down transformers.

Boiler and auxiliary equipment will be locally manufactured whereas both turbo generators will be imported.

8.2 Investment Estimation

8.2.1 Precondition

- a) The costing of project estimation is based upon consultant's experience to build similar power plants, and data from plant suppliers.
- b) We considered and calculated the direct cost of equipment supply, installation and erection, civil construction as well as plant testing. 8% import charges for all the total equipment and installation materials price (considering all equipment and installation material ,to be imported) is considered.

Annual loan interest rate of 12.5% for all investment (assume all investment will be coming from bank loan).

Sea freight of Rs.8, 000 per ton for all equipment and installation materials.

The cost for project management, bank charges and other taxes and duties are not calculated, exactly but assumed.

- c) The money exchange rate considered is 1US\$ = Rs.100
- d) The cost of auxiliary materials for installation is included in the cost of installation works as shown in **Table-8.3**.
- e) Cost of electric power per unit Rs.11.00
- f) Cost of bagasse Rs.2500.00 per ton
- g) Power supplied to sugar processing 5.2MW/Hr during season of 110 days.
- h) Power supplied to DISCO 15.9MW/Hr during season and 9.50 during off-season.
- i) Steam sent to sugar processing 125t/hr
- j) Cost of steam Rs.1075 per ton
- k) Cost of electric power generation (fuel based) Approx.
 $1075 \times 6 \times 1.25 = 8.1/\text{kWh}$
- l) Bagasse required for 132t/hr steam = 56.5t/hr (During Season)
Bagasse required for 45.0t/hr steam = 19.3t/hr (During Off-season)
- m) Condensate return $125\text{t} \times 0.8 \times 24 \times 110$ (season)
- n) Demin/RO water required 27t/hr 71,280tons
- o) Self Power consumption of Extraction Condensing TG (16000KW)
During Season 1850KW
During off Season 1880KW

8.3 Table of the Project Cost Estimation

S.No.	Equipment/Activity	Cost in Millions
1.	Steam Turbo Generator (02Nos) Back Pressure & Extraction Condensing Turbo Generator (16 + 16MW) alongwith Panels and Control Equipment.	382.00
2.	Cooling Tower and Allied Equipment	15.00
3.	Overhead Crane	4.50
4.	Piping (Low and High Pressure)	25.00
5.	Pressure Reducing & De-super Heating Station	5.00
6.	Electrical & Instrumentation Equipment	30.00
7.	Consultancy Charges	12.50
8.	Installation Cost	15.00
9.	Equipment required for Connectivity with National Grid	20.00
10.	Civil Work	30.00
11.	Miscellaneous & Contingencies	11.00
	Total	Rs.550.00

S.NO.	Equipment/Activity	Cost in Millions
1.	Boiler 135TPH 67Kg/Cm2, 485C Complete with Accessories	310.00
2.	Piping Fitting	30.00
3.	Electrical & Instruments	40.00
4.	Installation Cost	30.00
5.	Civil Work	40.00
	Total	Rs.450.00

8.4 Brief Economic Study

8.4.1 Basic Data

Duration of Operation (110 days during season) + (35 days during off-season)

S#	Description	Annual Output/Consume	Unit Cost	Total Rs
Income				
1	Power supply to DISCO 15.85MWx110days+9.5MWX35x35	49,824,000 kWh	Rs.11.0/kWh	548,064,000
2	Power supply to sugar plant 5.15MW/hr 110days	13,596,000 kWh	Rs.8.1	110,127,000
3	Sale of steam to sugar plant @ 125t/hr x 110days	330,000Ton	Rs.1075/Ton	354,750,000
Total Sales				Rs. 1,012,941,000

Expenses

1	Fuel bagasse (1850kcal/kg) @ (56.5x110x24) + (19.3x24x35)	165,372 tons/year	Rs.2500/ton	413,430,000
2	Condensate purchase 125 x 0.8 = 100t/hr during season	264,000Ton	Rs.6/ton	1,584,000
3	Water expenses 40Tt/hr	139,200ton	Rs.5/ ton	696,000
4	Wage of employees:	47 persons	Rs.300,000 /person/year	14,100,000
5	Chemicals			
	40% NaOH	26.1 ton	25,000 Rs./ton	652,000
	35% HCl	26.1 ton	20,600 Rs./ton	522,000
	98% Na ₃ PO ₄ -12H ₂ O	17.5 ton	30,000 Rs./ton	525,000
	Chemicals for circulating water			
	Ammonia	1.75 ton	300,000Rs./ton	525,000
		1.75 ton	40,000 Rs./ton	70,000
6	Maintenance	69,884,000 kWh	0.02 Rs./kWh	1,398,000
7	Lubricant	69.884,000 kWh	0.015 Rs./kWh	1,048,000
Total Expenses				Rs.434,550,000

8.4.2 Preconditions

- | | | |
|----|--|-----------------------|
| a) | Construction period | 14 months |
| b) | Payment schedule | |
| | 1 st month investment | 15% of capital assets |
| | 3 rd month investment | 65% of capital assets |
| | 9 th month investment | 10% of capital assets |
| | 15 th month investment | 10% of capital assets |
| c) | The full power generating capacity will be reached within two months after completion. | |
| d) | Total capital investment will be bank loan, and the annual interest rate is 10%. | |
| e) | Depreciation period | 10 years |
| f) | Calculating period | 10 years |

8.4.3 Investment

a) Capital assets investment

Total Cost	Rs.1000,000,000
Loan 70%	Rs.700,000,000
Interest @ 12.5%	

8.4.4 Economical Evaluation Index

- | | | |
|-----|---|--|
| a.) | Average annual production value for 10 years | Rs.1,012,941,000 |
| b.) | 1. Average annually total cost for 10 year | Rs.434,550,000 |
| | 2. Including interests of loan/year (average] | Rs. 87,500,000 |
| | 3. Including depreciation | Rs. 70,000,000 |
| | 4. Total annual expenses | Rs.592,050,000 |
| c.) | Average annual profit for 10 years.(a-b-4) | Rs.420,891,000 |
| d.) | Profit margin against investment. | 42.09% |
| e.) | Total investment payback period | 2.376 years |
| f.) | Average power generating cost for 10 years | $509,364,000 - 283,800,000 / 69,884,000$ |
| | Average COGEN | = Rs.3.25/kWh |
| g.) | Average Power Generation Cost Fuel Based | |
| | $509,364,000/69,884,000$ | = Rs.8.470/kWh |

8.5 Economic Index

Calculation table based on sugar crushing season 110days + 35 days

Table of Evaluating Indexes

Sr. No.	Item	Unit	In Season	In off-season
1	Power Generating Capacity			
1.1	Annual power generating capacity	kWh	60,324,000	9,559,200
1.2	Annual power supply capacity	kWh	55,440,000	7,980,000
2	Investment Guideline of the Project			
2.1	Gross investment		1000,000,000	
2.2	Capital investment		976,500,000	
3	Power Generating Cost per kWh (average 10year) COGEN	Rs./kWh	3.40	Average for 10 years
4	Power Generating Cost per kWh Fuel Based	Rs./kWh	8.47	
4.1	Annual sales income (average 10years)		1,012,941,000	Average for 10 years
4.2	Distributable profit (average 10yrs)		420,891,000	Average for 10 years
	Profit Margin Against Investment (average 10yrs)	%	42.09	Average for 10 years
5	Payback Period of Investment	Year	2.376	

9. Feasibility Analysis

9.1 Basic Assumptions

9.1.1 Project outline

- (1) Project schedule:
 - Construction period 14 months
 - Commercial operation period 30 years
- (2) A, Plant capacity at full operation (during season) 60,324,000 kW/year
 - B, Electric Power Sale (during season) 55,440,000 kW/year
- (3) Operation conditions:
 - Annual operation days during season 110 days
 - Annual operation days during off-season 35 days
 - Capacity utilization(first yr & after) boiler 100%
 - Capacity utilization turbo generator 85%

9.1.2 Price basis.

- (1) 11KV electricity sale price per kwh **DISCO** Rs.11.0/kWh
- (2) (2) Steam sale to **SHAHTAJ** sugar mills Rs.1075 /ton
- (3) 10% increase in above sale price considered, after 5yrs
- (4) Electricity sale per kWh SSML Rs.8.1

9.1.3 Depreciation

Machinery and civil works 10 years straight line

9.1.4 Financial conditions.

- (1) Debt equity ratio:
 - Equity 30%
 - Debt 70%
- (2) Assumed condition of loan:
 - Amortization 10 years
 - Long term loan interest rate 12.5%

SELECTION OF POWER PLANT CAPACITY

	Total Load	22850kWh
	Self load of power plant	1850kWh
	During season power available for Sale	21000kWh
	During off-season power available (11.38 – 1.88)	9500kWh
	Steam required @6.0 Kg/kWh during season	132,000 Kg/hr
	Steam required during off season	45,000Kg/hr
A-	Boiler selected pressure 67kg/Cm ² temp. 485°C	135000kg/hr
B-	Turbo generator required power back pressure type	16000kW
	Turbo generator Ext. Cond. Type	16000kW

Annexure - B

Steam Produced from Renewable Energy Fuel (Bagasse)

Temperature of boiler feed water	=	105 °C
Heat in feed water	=	105 Kcal/Kg
Pressure of steam	=	67 Kg/cm ²
Temperature	=	485 °C
Heat in steam	=	790 Kcal/Kg
Net heat gained by steam	=	790 – 105
		685 Kcal/Kg
Boiler efficiency (overall)	=	86%
Calorific value of bagasse	=	1850 Kcal/Kg
Net heat available from bagasse	=	1850x0.86
	=	1591 Kcal/Kg
Steam produce by 1 Kg bagasse	=	1591/685
	=	2.33 Kg
Say	=	2.33 Kg

Fuel Cost Per Unit Electricity

Cost of Bagasse per ton	=	Rs.2500
Cost of Bagasse per Kg	=	Rs.2.5
Steam required per kW electricity	=	6.0Kg
Cost of steam per Kg	=	Rs.1.075
Cost of fuel per Kwh (with financial charges) @ 1.25	=	Rs.6.45
	6.45x1.25	= Rs.8.063
	Approx	= Rs.8.1

Annexure B - 1

Bagasse Requirement for Steam Production

Bagasse available @ 28% fibre in cane	=	400x0.28
	=	112 t/hr
Steam from high pressure boiler for T.G	=	132 t/hr
During season Bagasse required for 132t steam @ 2.33Kg/Kg bagasse	=	56.5 t/hr
Off-season Bagasse required for 45.0t steam @ 2.33Kg/Kg bagasse	=	19.3 t/hr
<u>Steam from low pressure boilers</u>		
Mill house Shredder	=	75 t/hr
L.P. turbo generator 5.5 MW (2.5MW)	=	25 t/hr
Total	=	100 t/hr
Bagasse required for low pressure boiler (Approx)	=	49.5 t/hr
Total bagasse required for boilers	=	56.5 + 49.5 = 106t/hr
Surplus bagasse available	=	112 - 106 = 6t/hr
Total season days	=	110 days
Total surplus bagasse	=	15840tons
Bagasse required for 45t steam	=	19.3t/hr
Number of days for TG operation in off-season (Approx)	=	35days

Electric Power Generation With Renewable Energy Fuel (Bagasse)

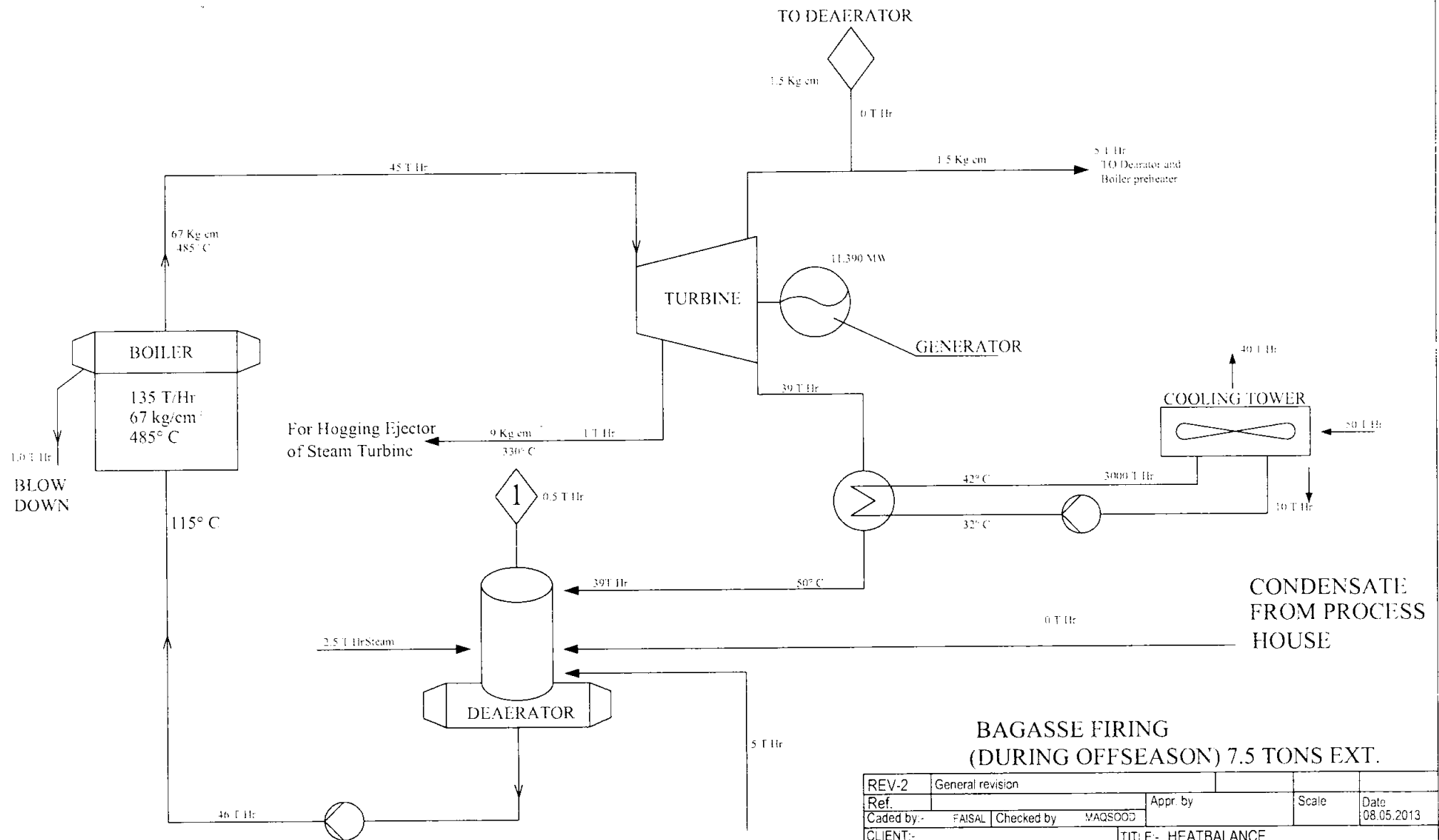
SHAHTAJ SUGAR MILLS want to operate two boilers of 80t/h & 60t/h on low pressure to supply steam to mill house turbines and low pressure turbo generator at 2.5MW. The steam required is 100tons/hr.

In the 1st phase they will install one set of high pressure boiler of 135t/hr & 67Kg/ Cm² pressure and two turbo generator of 16000kW extraction condensing type and 16000kW back pressure type.

Steam and Power Available will be:**During Cane Crushing Season**

a.	High pressure turbo generator of 16000kW	
	at 27.5t/hr extraction steam required and 7850kW	= $6.0 \times 7850 = 47.5\text{ton}$
	back pressure steam required for 16000kW	= 84.5
	BFW required for H.P. Boiler (add @ 2% blow down)	= 134.65t/hr
	Bagasse required @ 2.33Kg steam/Kg Bagasse	= 56.5t
b.	Low pressure boiler and turbo generator	
	mill house turbines	= 75t/hr
	L.P. turbo generator (5.5MW) for 2.5MW	= 25t/hr
	Total L.P. steam	= 100t/hr
	Bagasse required for L.P steam (Approx)	= 49.5tons
c.	Total Bagasse required	= $56.5 + 49.5 = 106\text{t/hr}$
	Bagasse available	= $400 \times 0.28 = 112\text{t/hr}$
	Surplus Bagasse	= $112 - 106 = 6\text{t/hr}$
	For 110 days	= 15840tons


d.	Electric power produced by B.P. turbo generator	=	15000kWh
	Electric power produced by Ext. Cond. TG	=	7850kW
	Self power consumption (During Season)	=	1850kWh
	Self power consumption (During off Season)	=	1880KW
	Power available	=	21000kWh
e.	Electric power produced by L.P. turbo generator	=	2500kWh
f.	Total power available	=	21000+2500 = 23500kWh
g.	Electric power required by sugar mill (5150+2500)	=	7650kWh
h.	Power available for selling	=	15850kWh

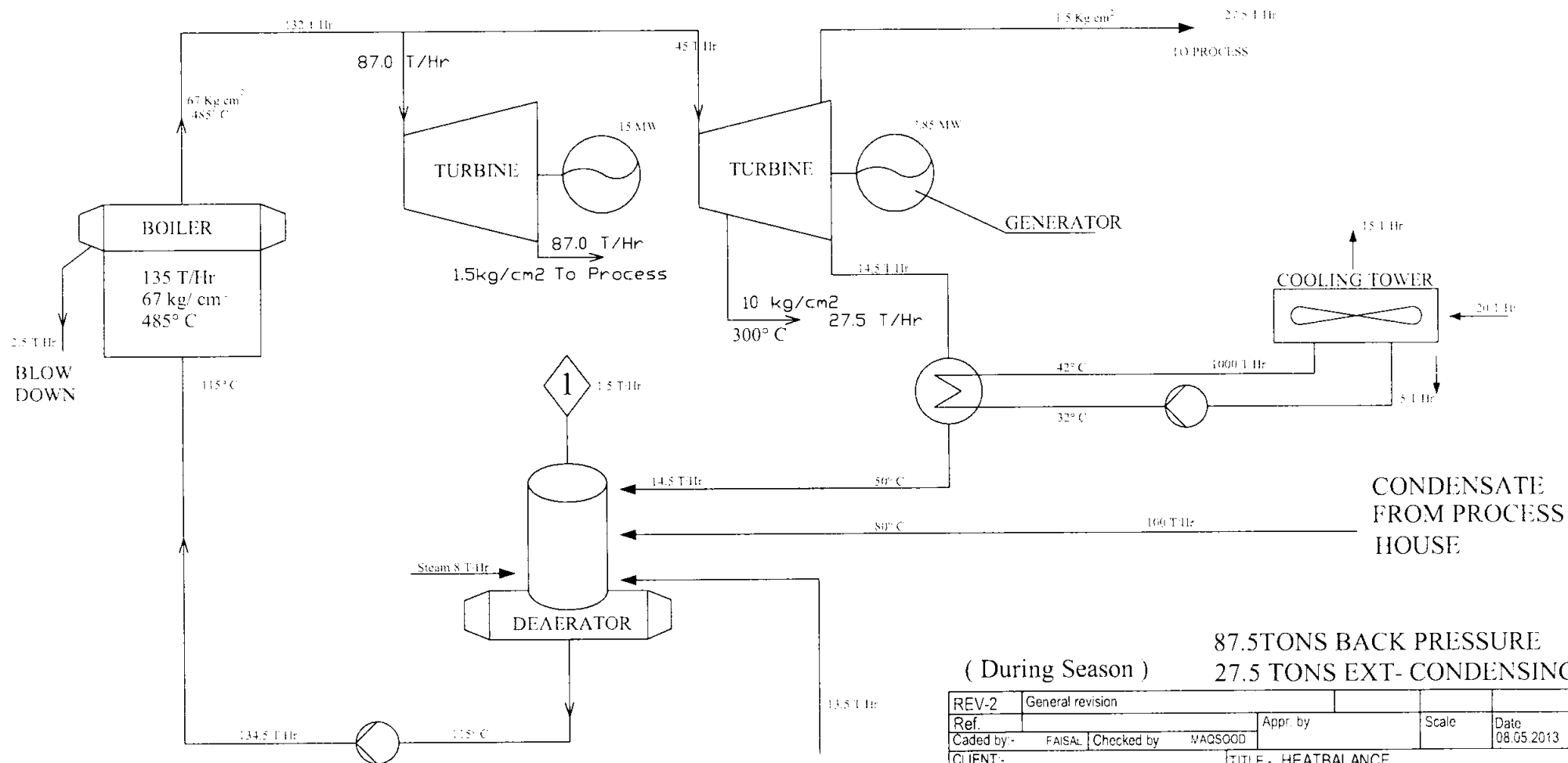


NOTE:-

- 1 Boiler : Capacity 135 T/Hr, 67 Kg/Cm², 485° C in operation
- 1 Turbo Generator Extraction Condensing : Capacity 16 MW in operation
- 1 Turbo Generator Back Pressure: Capacity 16 MW not in operation

BAGASSE FIRING (DURING OFFSEASON) 7.5 TONS EXT.

REV-2	General revision				
Ref				Appr. by	Scale
Caded by:-	FAISAL	Checked by	MAQSOOD		Date 08.05.2013
CLIENT:-			TITLE:- HEATBALANCE 16000 KW POWER PLANT 0 T/H PROCESS STEAM EXTRACTION		
SHAHTAJ SUGAR POWER PLANT			DWG No:-		
			TC-01-0004-00		
TECHNICAL CONSULTANT G-11 MARKAZ - ISLAMABAO PAKISTAN			Rev.		
			03		



NOTE:-

- 1 Boiler : Capacity 135 T/Hr, 67 Kg/Cm², 485° C in operation
- 1 Turbo Generator Extraction Condensing : Capacity 16 MW in operation
- 1 Turbo Generator Back Pressure : Capacity 16 MW in operation

MAKE UP

(During Season)
87.5 TONS BACK PRESSURE
27.5 TONS EXT- CONDENSING

REV-2	General revision			
Ref.		Appr. by	Scale	Date
Caded by:-	FAISAL	Checked by	MAQSOOD	08.05.2013
CLIENT:-	TITLE:- HEATBALANCE 22850 KW POWER PLANT 125 T/H PROCESS STEAM			
	SHAHTAJ SUGAR POWER PLANT			
	TECHNICAL CONSULTANT G-11 MARKAZ -ISLAMABAD PAKISTAN			
	DWG No:- TC-01-0003-00			
	Rev. 03			



INTERCONNECTION STUDY

For

32 MW SHAHTAJ SUGAR MILLS LTD. POWER PLANT FOR SUPPLY OF 15MW SPILLOVER TO THE NATIONAL GRID



*Final Report
(March 2016)*

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Executive Summary

- ❖ The Final Report of Interconnection of the 32 MW Shahtaj Sugar Mill limited for the supply of 15 MW to the GEPCO grid system is submitted herewith.
- ❖ The study objective, approach and methodology of this final report have been described and the plant's data received from the Client is validated.
- ❖ The updated GEPCO/NTDC system data as available with PPI for other studies have been used with latest load forecast and system expansion plans of NTDC and GEPCO. Moreover the GEPCO scheme that has been used in the study for base year as well as future year has been confirmed from GEPCO via email on 3 March 2016. The Network of FESCO has also been confirmed via FESCO GSO Officials.
- ❖ The nearest grids is 132 kV Mandi Bahaudin Grid Station as shown in Sketch-1 in Appendix-B.
- ❖ The interconnection of 32 MW Shahtaj Sugar Mill (15 MW Spill Over to the GEPCO system) is proposed by connecting a 132 kV double circuit from Mandi Bahaudin, approximately 1 km, using Rail conductor. The scheme has been developed after confirmation with GEPCO. The scheme is shown in Sketch-2 in Appendix-B.
- ❖ The planned COD of Shahtaj PP after confirmation from Shahtaj Sugar Mills is January 2017. The above proposed interconnection scheme has been tested for steady state conditions through detailed load flow studies for the peak load conditions of January 2017 for maximum thermal power dispatches in the grid. The system conditions of normal and N-1 contingency have been studied to meet the reliability criteria of NEPRA Grid Code.
- ❖ Steady state analysis by load flow for peak load of January 2017 reveals that the proposed scheme is adequate for the supply 15 MW Spillover of the Plant to the GEPCO system, under normal as well as contingency conditions. Steady state analysis by load flow for peak load of January 2017 as well as future case of January 2022 is also studied to evaluate the impact on the FESCO and IESCO network and it was found that the proposed scheme is adequate for the supply 15 MW Spillover of the Plant to the GEPCO system, under normal as well as contingency conditions.



- ❖ The proposed scheme of interconnection has no technical constraints or problems, it fulfills all the criteria of reliability and under steady state load flow and contingency load flows; and is therefore recommended to be adopted.
- ❖ The short circuit analysis has been carried out to calculate maximum fault levels at Shahtaj PP and the substations of 132kV in its vicinity. We find that the fault currents for the proposed scheme are within the rated short circuit capacities of switchgear installed at these substations. There are no violations of exceeding the rating of the equipment due to contribution of fault current from Shahtaj PP.
- ❖ The maximum short circuit level of Shahtaj 11 kV bus bar in 2017 is 32.84 kA and 30.13 kA and in 2022 the values are 37.17 kA and 34.73 kA for 3-phase and 1-phase faults respectively. It would be advisable to go for standard size switchgear of short circuit rating of 40 kA. It would provide a margin for any future increase in short circuit levels due to future generation additions and network reinforcements in this area.
- ❖ The dynamic stability analysis of proposed scheme of interconnection has been carried out. The stability check for the worst case of three phase fault right on the 132 kV bus bar of Shahtaj PP substation followed by the final trip of 132 kV circuits emanating from this substation, has been performed for fault clearing of 5 cycles (100 ms) as understood to be the normal fault clearing time of 132 kV protection system and for 9 cycles (180 ms) which represents the stuck breaker case in which the backup protection acts to isolate the fault.
- ❖ The proposed scheme of interconnection has no technical constraints or problems, it fulfills all the criteria of reliability and under steady state load flow and contingency load flows; and is therefore recommended to be adopted.



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1. Introduction

1.1 Background

Currently Shahtaj Sugar Mills Limited is connected to Mandi Bahaudin 132/11kV Substation at 132 kV by a radial circuit and meets its own load demand. Shahtaj Sugar Mills would like to go for high pressure cogeneration in the sugar mill with the aim of exporting power to the grid both during the crushing season and little while after it. The interconnection of Shahtaj to evacuate its maximum power of 15 MW (Gross Capacity is 32MW) to the GEPCO system is proposed by connecting a 132 kV double circuit from Mandi Bahaudin, approximately 1 km, using Rail conductor in the concession area of Gujranwala Electric Power Company (GEPCO). The location of Shahtaj Sugar Mills is shown in the sketch attached in Appendix-B. The project is expected to start commercial operation by January 2017. The electricity generated from this project would be supplied to the grid system of GEPCO through 132 kV grid available in the vicinity of this project.

1.2 Objectives

The overall objective of the Study is to evolve an interconnection scheme between Shahtaj Sugar Mills and GEPCO network, for stable and reliable evacuation of 15 MW of electrical power generated from this plant (Gross Capacity is 32 MW) , fulfilling N-1 reliability criteria. The specific objectives of this report are:

1. To develop scheme of interconnections at 132 kV for which right of way (ROW) and space at the terminal substations would be available.
2. To determine the performance of interconnection scheme during steady state conditions of system, normal and N-1 contingency, through load-flow analysis.
3. To check if the contribution of fault current from this new plant increases the fault levels at the adjoining substations at 132 kV voltage levels to be within the rating of equipment of these substations, and also determine the



short circuit ratings of the proposed equipment of the substation at Shahtaj Sugar Mills PP.

4. To check if the interconnection withstands dynamic stability criteria of post fault recovery with good damping.

1.3 Planning Criteria

The planning criteria required to be fulfilled by the proposed interconnection is as follows:

Steady State:

Voltage	$\pm 5\%$, Normal Operating Condition $\pm 10\%$, Contingency Conditions
Frequency	50 Hz Nominal 49.8 Hz to 50.2 Hz variation in steady state 49.4 - 50.5 Hz, Min/Max Contingency Freq. Band
Power Factor	0.8 Lagging; 0.9 Leading

Short Circuit:

11 kV Substation Equipment Rating	40 kA
132 kV Substation Equipment Rating	40 kA

Dynamic/Transient:

The system should revert back to normal condition after dying out of transients without losing synchronism with good damping.

- For 132 kV and above, the total normal fault clearing time from the instant of initiation of fault current to the complete interruption of current, including the relay time and breaker interruption time to isolate the faulted element, is equal to 100 ms (5 cycles).
- In case of failure of primary protection (stuck breaker case), the total fault clearing time from the instant of initiation of fault current to the complete interruption of current to isolate the faulted element, including the primary



protection plus the backup protection to operate and isolate the fault, is equal to 180 ms (9 cycles) for 132 kV and higher voltage levels

2. Assumptions of Data

The number of generating units at Shahtaj Sugar Mills is two. As per the data provided by the client the following assumptions have been made:

2.1 Shahtaj Sugar Mills data

Generator data:

Installed capacity of power plant	= 2x16 MW
Lump sum maximum <u>generating capacity</u>	= 32 MW
Power factor	= 0.8 lagging, 0.9 leading
Lump sum MVA capacity	= 40 MVA
Generating Voltage	= 11 kV

2.2 Network data

The 132 kV network in the area near Shahtaj Sugar Mills is as shown in Sketches in Appendix-B. The latest system data of GEPCO and FESCO has been used after confirmation from the relevant DISCO. The latest Generation Expansion Plan, Transmission Expansion Plan and Load Forecast has been used as developed by NTDC/GEPCO which is attached in Appendix-A.



3. Study Approach and Methodology

3.1 Understanding of the Problem

Shahtaj Sugar Mills Limited is a 32 MW Bagasse based Thermal Power Plant.

The electricity generated from this project would be supplied to the grid system of NTDC/GEPCO through 132 kV Mandi Bahaudin grid is available in the vicinity of this project.

The interconnection of Shahtaj to evacuate 15 MW Spill Over to the GEPCO system is proposed by connecting a 132 kV double circuit from Mandi Bahaudin, approximately 1 km, using Rail conductor. This scheme has been developed after confirmation from GEPCO. The scheme is shown in Sketch-2 in Appendix-B.

The proposed power plant embedded in local network in this area shall provide relief to the source substation of in its vicinity which is feeding the grid stations of Mandi Bahaudin, Phalia, Head Faqiran, and the 132 kV circuits emanating from these substations that feed good load centers with significant load demand. The proposed power plant would also meet the complete load demand of Shahtaj Sugar Mills.

The adequacy of GEPCO network of 132 kV in and around the proposed site of Shahtaj Sugar Mills has been investigated in this study for absorbing and transmitting this power fulfilling the reliability criteria.

3.2 Approach to the problem

The consultant has applied the following approaches to the problem:

- A base case network model has been prepared for January 2017, in which the peak load scenario will occur after the commissioning of Shahtaj Sugar Mills by January 2017, comprising all 500kV, 220kV and 132 kV system, envisaging the load forecast, the generation additions and transmission expansions for that year particularly in GEPCO.
- Month of January 2017 has been selected for the study because it represents the maximum thermal dispatch conditions when hydal generation is at its minimum



can be monitored after the COD of Shahtaj Sugar Mills. Thus the loading on the lines in the vicinity of Shahtaj Sugar Mills will be maximum allowing us to judge the maximum impact of the plant on the transmission system in its vicinity.

- Interconnection scheme without any physical constraints, like right of way or availability of space in the terminal substations, have been identified.
- Performed technical system studies for peak load conditions to confirm technical feasibility of the interconnection schemes. The schemes have been subjected to standard analysis like load flow and short circuit, and transient stability study to check the strength of the machines and the proposed interconnection scheme under disturbed conditions.
- Determine the relevant equipment for the proposed technically feasible schemes.
- Recommend the technically most feasible scheme of interconnection.



4. Development of Scheme of Interconnection

4.1 The Existing and Ongoing Network

The existing 132 kV network available around Shahtaj Sugar Mills is shown in Sketch-1 in Appendix-B.

Due to the layout of the network in the vicinity of Shahtaj Sugar Mills, the most feasible interconnection scheme would be connecting Shahtaj Sugar Mills of Shahtaj to evacuate 15 MW Spill Over to the GEPCO system is proposed by connecting a 132 kV double circuit from Mandi Bahaudin, approximately 1 km, using Rail conductor. This scheme has been developed after confirmation from GEPCO. The scheme is shown in Sketch-2 in Appendix-B.

4.2 The Scheme of Interconnection of Shahtaj Sugar Mills

Keeping in view of the above mentioned 132 kV network available in the vicinity of the site of the Shahtaj Sugar Mills, the interconnection of Shahtaj to evacuate 15 MW Spill Over to the GEPCO system is proposed by connecting a 132 kV double circuit from Mandi Bahaudin, approximately 1 km, using Rail conductor. The scheme is shown in Sketch-2 in Appendix-B.



5. Detailed Load Flow Studies

5.1 Base Case Peak Load Flow January 2017, Without Shahtaj Sugar Mills

A base case has been developed for the peak load of January 2017 using the network data of NTDC and GEPCO after confirmation from the DISCO, after updating with latest load forecast and expansion plan of NTDC and GEPCO. The peak load of the year 2017 for GEPCO has been modeled as per the latest PMS Demand forecast obtained from NTDC.

The results of load flow for this system are plotted in Exhibit 0.0 of Appendix-C, which comprises of the 132 kV network in the vicinity of Mandi Bahaudin, including Phalia, Head Faqiran, Ludewala-N, Helan, Dinga and Kuthiala Shaikhan. These substations that feed good load centers with significant load demand.

The load flow results show that the power flows on all the circuits are within their normal rating. The voltage profile of these surrounding substations is also within normal limits.

For N-1 contingency conditions we have performed the following cases

Exhibit - 0.1	Mandi Bahaudin to Phalia 132 kV Single Circuit Out
Exhibit - 0.2	Head Faqiran to Phalia 132 kV Single Circuit Out
Exhibit - 0.3	Bhalwal to Bhabra 132 kV Single Circuit Out
Exhibit - 0.4	Hellan to Mandi Bahu Din 132 kV Single Circuit Out
Exhibit - 0.5	Ludewala-New to Ludewala 132 kV Single Circuit Out

For Exhibit 0.4, we observe that during this case under voltages are observed at a couple of buses. In all other cases, we see that the power flows on all circuits remain within their rated limits. Also the bus voltages are within the acceptable operating range.



5.2 Load Flow January Peak 2017 with 32 MW Shahtaj Sugar Mills

The interconnection of Shahtaj to evacuate 15 MW Spill Over to the GEPCO system is proposed by connecting a 132 kV double circuit from Mandi Bahaudin, approximately 1 km, using Rail conductor.

Load flow studies have been carried out for January 2017 because it represents the maximum thermal dispatch conditions in the grid after the COD of Shahtaj Sugar Mills. Thus the loading on the lines in the vicinity of Shahtaj Sugar Mills will be maximum, allowing us to judge the maximum impact of the plant on the transmission system in its vicinity. The results of load flow with Shahtaj Sugar Mills interconnected as per proposed scheme are shown in Appendix-C.

The results of Normal case of Peak January 2017 are plotted in Exhibit 1.0.

The power flows on the circuits are seen well within the rated capacities and the voltages on the bus bars are also within the permissible operating range of $\pm 5\%$ off the nominal. We find no capacity constraints on 132 kV circuits under normal conditions i.e. without any outages of circuits.

N-1 contingency analysis has been carried out and the plotted results are attached in Appendix – C as follows:

Exhibit - 1.1	Shahtaj to Mandi Bahaudin 132 kV Single Circuit Out
Exhibit - 1.2	Shahtaj 132/11 kV Single Transformer Out
Exhibit - 1.3	Mandi Bahaudin to Phalia 132 kV Single Circuit Out
Exhibit - 1.4	Head Faqiran to Phalia 132 kV Single Circuit Out
Exhibit - 1.5	Bhalwal to Bhabra 132 kV Single Circuit Out
Exhibit - 1.6	Mandi Bahaudin to Hellan 132kV Single Circuit Out
Exhibit - 1.7	Ludewala-New to Ludewala 132 kV Single Circuit Out

We see that in all the contingency cases, in the event of outage of any circuit, the intact circuits remain within the rated capacity. Also the bus bar voltages are well within the



permissible limits in the entire contingency event .Under voltages and overloading of Ludewala 220/132 kV Transformers which were observed previously were also rectified due to the addition of Shahtaj Sugar Mills PP.

5.3 Load Flow January Peak 2022 with 32 MW Shahtaj Sugar Mills

Load flow studies have been carried out for future year to study the impact of the plant. Again the month of January 2022 because it represents the maximum thermal dispatch conditions in the grid. Thus the loading on the lines in the vicinity of Shahtaj Sugar Mills will be maximum, allowing us to judge the maximum impact of the plant on the transmission system in its vicinity. The results of load flow with Shahtaj Sugar Mills in the month of Jan 2022 are shown in Appendix-C.

The results of Normal case of Peak January 2022 are plotted in Exhibit 2.0. The power flows on the circuits are seen well within the rated capacities and the voltages on the bus bars are also within the permissible operating range of $\pm 5\%$ off the nominal.

We find no capacity constraints on 132 kV circuits under normal conditions i.e. without any outages of circuits.

N-1 contingency analysis has been carried out and the plotted results are attached in Appendix – C as follows;

Exhibit - 2.1	Shahtaj to Mandi Bahauddin 132 kV Single Circuit Out
Exhibit - 2.2	Shahtaj 132/11 kV Single Transformer Out
Exhibit - 2.3	Phalia to Mandi Bahau Din 132 kV Single Circuit Out
Exhibit - 2.4	Head Faqiran to Phalia 132 kV Single Circuit Out
Exhibit - 2.5	S.PR.Nor to Bhalwal 132 kV Single Circuit Out
Exhibit - 2.6	Ludewala-New to Ludewala 132 kV Single Circuit Out



We see that in all the contingency cases, in the event of outage of any circuit, the intact circuits remain within the rated capacity. Also the bus bar voltages are well within the permissible limits in all the contingency event.

5.4 Conclusion of Load Flow Analysis

From the analysis discussed above, we conclude that the proposed interconnection scheme of connecting Shahtaj Sugar to evacuate 15 MW Spill Over to the GEPCO system is proposed by connecting a 132 kV double circuit from Mandi Bahaudin, approximately 1 km, using Rail conductor, under normal and contingency conditions tested for peak load conditions of January 2017 as well as January 2022. In all the normal and contingency cases, we find that the loading on the circuits remain within the rated capacity. Also the bus bar voltages are well within the permissible limits in all the normal and contingency events. Under voltages which were observed were also rectified due to the addition of Shahtaj Sugar Mills PP.



6. Short Circuit Analysis

6.1 Methodology and Assumptions

The methodology of IEC 909 has been applied in all short circuit analyses in this report for which provision is available in the PSS/E software used for these studies. The maximum fault currents have been calculated with the following assumptions under IEC 909:

- Set tap ratios to unity
- Set line charging to zero
- Set shunts to zero in positive sequence
- Desired voltage magnitude at bus bars set equal to 1.10 P.U. i.e. 10 % higher than nominal, which is the maximum permissible voltage under contingency condition.

For evaluation of maximum short circuit levels we have assumed contribution in the fault currents from all the installed generation capacity of hydel, thermal and nuclear plants in the system in the year 2017 as well as future case of year 2022 i.e. all the generating units have been assumed on-bar in fault calculation's simulations.

The assumptions about the generator and the transformers data are the same as mentioned in Ch.2 of this report.

6.2 Fault Current Calculations without Shahtaj Sugar Mills, 2017

In order to access the short circuit strength of the network of 132 kV without Shahtaj Sugar Mills for the grid of GEPCO and NTDC in the vicinity of the site of the Plant near Mandi Bahaudin and Phalia, fault currents have been calculated for balanced three-phase and unbalanced single-phase short circuit conditions. These levels will not only give us the idea of the fault levels without Shahtaj Sugar Mills and later on how much the contribution of fault current from Shahtaj Sugar Mills may add to the existing levels. but also we get a feel of the probable nodes to connect this Power Plant depending on their relative short circuit strength.

The results are attached in Appendix – D.



The short circuit levels have been represented graphically on the bus bars of 132 kV which are shown in the Exhibit 3.0 attached in Appendix-D.

The fault currents in the Exhibit are given in polar coordinates i.e. the magnitude and the angle of the current. The total fault current is shown below the bus bar.

The tabular output of the short circuit calculations is also attached in Appendix-D for the 132 kV bus bars of our interest i.e. the substations connecting in the 132 kV and circuits lying close to Shahtaj Sugar Mills. The total maximum fault currents for 3-phase and 1-phase short circuit at these substations are summarized in Table 6.1. We see that the maximum fault currents do not exceed the short circuit ratings of the equipment at these 132 kV substations which normally are 20 kA, 25 kA or 31.5 kA for older substations and 40 kA for new substations.

Table 6.1
Maximum Short Circuit Levels without Shahtaj Sugar Mills, 2017

Bus Name	3-Phase Fault Current	1-Phase Fault Current
Phalia 132kV	3.34	1.96
H.Faqiran 132kV	3.89	2.23
Ludenwala 132kV	13.48	13.14
Bhera 132kV	4.34	2.63
Ludenwala New 132kV	15.63	14.85
S.PR.NON 132kV	6.71	4.50
Bhalwal 132kV	5.69	3.54
Kuthil.S 132kV	4.17	2.47
Dinga 132kV	4.23	2.61
Helan 132kV	3.75	2.26
M.B.Din 132kV	3.33	1.97

6.3 Fault Current Calculations with Shahtaj Sugar Mills interconnected, 2017

Fault currents have been calculated for the electrical interconnection of proposed scheme. Fault types applied are three phase and single-phase at the 132 kV bus bar of



Shahtaj Sugar Mills itself and other bus bars of the 132 kV substations in the electrical vicinity of Shahtaj Sugar Mills. The graphic results are shown in Exhibit 3.1.

The tabulated results of short circuit analysis showing all the fault current contributions with short circuit impedances on 132 kV bus bars of the network in the electrical vicinity of Shahtaj Sugar Mills and the 132 kV bus bars of Shahtaj Sugar Mills are placed in Appendix-D. Brief summary of fault currents at significant bus bars of our interest are tabulated in Table 6.2

Table 6.2

Maximum Short Circuit Levels with Shahtaj Sugar Mills, 2017

Bus Name	3-Phase Fault Current	1-Phase Fault Current
Shahtaj 11kV	32.84	30.13
Shahtaj 132kV	4.12	2.98
Phalia 132kV	3.91	2.63
H.Faqiran 132kV	4.20	2.58
Ludenwala 132kV	13.60	13.23
Bhera 132kV	4.55	2.87
Ludenwala New 132kV	15.79	14.98
S.PR.NON 132kV	6.73	4.50
Bhalwal 132kV	5.70	3.54
Kuthil.S 132kV	4.17	2.47
Dinga 132kV	4.64	3.01
Helan 132kV	4.20	2.77
M.B.Din 132kV	4.12	2.98

Comparison of Tables 6.1 and 6.2 show slight increase in short circuit levels for three-phase and single – phase faults due to connection of Shahtaj Sugar Mills on the 132 kV bus bars in its vicinity. We find that even after some increase, these fault levels are much below the rated short circuit values of the equipment installed on these substations. The short circuit level at Shahtaj Sugar Mills 11 kV bus bar is 32.84 kA and 30.13 kA for 3-phase and 1-phase faults respectively. Therefore industry standard switchgear of the



short circuit rating of 40 kA would be fine to be installed at the 11 kV substation of Shahtaj Sugar Mills. It would provide large margin for any future increase in short circuit levels due to future generation additions and network reinforcements in this area.

6.4 Fault Current Calculations with Shahtaj Sugar Mills interconnected, 2022

Fault currents have been calculated for the future year of 2022. Fault types applied are three phase and single-phase at the 132 kV bus bar of Shahtaj Sugar Mills itself and other bus bars of the 132 kV substations in the electrical vicinity of Shahtaj Sugar Mills. The graphic results are shown in Exhibit 3.2.

The tabulated results of short circuit analysis showing all the fault current contributions with short circuit impedances on 132 kV bus bars of the network in the electrical vicinity of Shahtaj Sugar Mills and the 132 kV bus bars of Shahtaj Sugar Mills are placed in Appendix-D. Brief summary of fault currents at significant bus bars of our interest are tabulated in Table 6.3

Table 6.3
Maximum Short Circuit Levels with Shahtaj Sugar Mills, 2022

Bus Name	3-Phase Fault Current	1-Phase Fault Current
Shahtaj 11kV	37.17	34.73
Shahtaj 132kV	5.42	3.85
M.B.Din 132kV	5.46	3.97
Phalia 132kV	5.97	3.98
H.Faqiran 132kV	16.35	11.43
Ludenwala 132kV	20.36	14.81
Bhera 132kV	8.26	5.14
Ludenwala New 132kV	23.25	18.29
S.PR.NON 132kV	7.17	4.49
Bhalwal 132kV	5.84	3.45
Kuthil.S 132kV	3.79	2.20
Dinga 132kV	4.93	3.12
Helan 132kV	4.67	3.00



The short circuit level at Shahtaj Sugar Mills 11 kV bus bar is 37.17 kA and 34.73 kA for 3-phase and 1-phase faults respectively which are well below the rated short circuit values of the equipment installed on these substations.

6.5 Conclusion of Short Circuit Analysis

The short circuit analysis results show that for the proposed scheme of interconnection of Shahtaj Sugar Mills, we don't find any problem of violations of short circuit ratings of the already installed equipment on the 132 kV substations in the vicinity of Shahtaj Sugar Mills due to fault current contributions from this power house under three-phase faults as well as single phase faults.

The short circuit level in 2017 at Shahtaj Sugar Mills 11 kV bus bar is 32.84 kA and 30.13 kA and in 2022 is 37.17 kA and 34.73 kA for 3-phase and 1-phase faults respectively. Therefore industry standard switchgear of the short circuit rating of 40 kA would be fine to be installed at 11 kV substation of Shahtaj Sugar Mills taking care of any future generation additions in its electrical vicinity.



7. Dynamic Stability Analysis

7.1 Assumptions & Methodology

7.1.1 Dynamic Models

The assumptions about the generator and its parameters are the same as mentioned in Ch.2 of this report.

We have employed the generic dynamic models available in the PSS/E model library for dynamic modeling of the generator, exciter and the governor as follows;

Generator	GENROU
Excitation System	EXST1
Speed Governing System	TGOV1

7.1.2 System Conditions

The proposed interconnection scheme of connecting Shahtaj Sugar to evacuate 15 MW Spill Over to the GEPCO system is proposed by connecting a 132 kV double circuit from Mandi Bahaudin, approximately 1 km, using Rail conductor.

All the power plants of WAPDA/PEPCO and IPPs from Tarbela to Hub have been dynamically represented in the simulation model.

7.1.3 Presentation of Results

The plotted results of the simulations runs are placed in Appendix-E. Each simulation is run for its first one second for the steady state conditions of the system prior to fault or disturbance. This is to establish the pre fault/disturbance conditions of the network under study were smooth and steady. Post fault recovery has been monitored for nine seconds. Usually all the transients due to non-linearity die out within 2-3 seconds after disturbance is cleared in the system.

7.1.4 Worst Fault Cases

Three phase faults are considered as the worst disturbance in the system. We have considered 3-phase fault in the closest vicinity of Shahtaj sugar Mills- i.e. right at the 132 kV bus bar of Shahtaj Sugar Mills , cleared in 5 cycles and 9 cycles. as normal and stuck breaker clearing times for 132 kV i.e. 100 ms and 180 ms respectively, followed by a permanent trip of a 132 kV single circuit emanating from this substation.



7.2 Dynamic Stability Simulations' Results – January 2017

7.2.1 Fault at 132 kV Shahtaj Power Plant

We applied three-phase fault on 132 kV bus bar of Shahtaj-PP to study the impact of a disturbance in the grid on the performance of the plant. The fault is cleared in 5 cycles (100 ms) as standard clearing time for 132 kV systems, followed by trip of 132 kV single circuit between Shahtaj PP and M.B.Din. We monitored different quantities for one second pre-fault and nine seconds after clearance of fault (post-fault) conditions and plotted the results attached in Appendix – E and discussed as follows;

Fig. 1.1 Bus Voltages

The bus voltages of 132 kV bus bars of Shahtaj PP 132 kV, Shahtaj 11kV, Phalia, Mandi Bahaudin, Head faqiran and Helan are plotted. The results show quick recovery of the voltages after clearing of fault.

Fig. 1.2 Frequency

We see the system frequency recovers back to normal quickly after fault clearance.

Fig. 1.3 MW/MVAR Output of Generators of Shahtaj PP

The pre-fault output of Shahtaj PP gets back to the same output quickly after fast damping of the oscillations in its output. However MVAR output acquires equilibrium at a new value.

Fig. 1.4 Speed and mechanical power of Generators at Shahtaj PP

The speed deviation of the generator, after clearing fault, damps down quickly returning to normal speed as of before fault. The transients in mechanical power also damp quickly and settle to a new equilibrium.

Fig. 1.5 MW/MVAR Flow on Shahtaj PP to M.B.Din 132 kV intact circuit

Followed by clearing of fault, the trip of a 132 kV single circuit from Shahtaj PP to M.B.Din causes significant increase in the flow on the intact 132 kV circuit between Shahtaj PP to Mandi Bahaudin. We plotted the flows of MW and MVAR on this intact circuit and see that the power flows on this circuit attains to steady state level with power swings damping down fast.



Fig. 1.6 Rotor Angles

The rotor angles of the generators of Shahtaj LV 11 kV, Mangla 132 kV, New Bong Escape 132 kV, G.Brotha 132 kV, Allai 220 kV are plotted relative to machines at Allai 220 kV. The results show that the rotor angle of Shahtaj PP gets back after the first swing and damps down quickly. Similarly the rotor angles of other machines swing little after the fault and damp fast after clearing of fault. The system is strongly stable and very strong in damping the post fault oscillations.

7.2.2 Fault at 132 kV Shahtaj Power Plant (Stuck Breaker)

We applied three-phase fault on 132 kV bus bar of Shahtaj PP to study the impact of a disturbance in the grid on the performance of the plant. The fault is cleared in 9 cycles (180 ms) that is the clearing time for stuck breaker case for 132 kV systems, followed by trip of 132 kV single circuit between Shahtaj PP and M.B.Din. We monitored different quantities for one second pre-fault and nine seconds after clearance of fault (post-fault) conditions and plotted the results attached in Appendix – E and discussed as follows:

Fig. 2.1 Bus Voltages

The bus voltages of 132 kV bus bars of Shahtaj PP 132 kV, Shahtaj 11kV, Phalia, Mandi Bahaudin, Head faqiran and Helan are plotted. The results show quick recovery of the voltages after clearing of fault.

Fig. 2.2 Frequency

We see the system frequency recovers back to normal quickly after fault clearance.

Fig. 2.3 MW/MVAR Output of Generators of Shahtaj PP

The pre-fault output of Shahtaj PP gets back to the same output quickly after fast damping of the oscillations in its output. However MVAR output acquires equilibrium at a new value.

Fig. 2.4 Speed and mechanical power of Generators at Shahtaj PP

The speed deviation of the generator, after clearing fault, damps down quickly returning to normal speed as of before fault. The transients in mechanical power also damp quickly and settle to a new equilibrium.

Fig. 2.5 MW Flow on Shahtaj PP to M.B.Din 132 kV circuit



Followed by clearing of fault, the trip of a 132 kV single circuit from Shahtaj PP to M.B.Din causes significant increase in the flow on the intact 132 kV circuit between Shahtaj PP to Mandi Bahaudin. We plotted the flows of MW and MVAR on this intact circuit and see that the power flows on this circuit attains to steady state level with power swings damping down fast.

Fig. 2.6 Rotor Angles

The rotor angles of the generators of Shahtaj LV 11 kV, Mangla 132 kV, New Bong Escape 132 kV, G.Brotha 132 kV, Allai 220 kV are plotted relative to machines at Allai 220 kV. The results show that the rotor angle of Shahtaj PP gets back after the first swing and damps down quickly. Similarly the rotor angles of other machines swing little after the fault and damp fast after clearing of fault. The system is strongly stable and very strong in damping the post fault oscillations.

7.2.3 Fault at 11 kV Shahtaj Power Plant (9 cycles Fault)

We applied three-phase fault on 11 kV bus bar of Shahtaj PP to study the impact of a disturbance in the grid on the performance of the plant. The fault is cleared in 9 cycles (180 ms) as standard clearing time for 11 kV systems, followed by trip of Shahtaj 132/11kV Single Transformer. We monitored different quantities for one second pre-fault and nine seconds after clearance of fault (post-fault) conditions and plotted the results attached in Appendix – E and discussed as follows:

Fig. 3.1 Bus Voltages

The bus voltages of 132 kV bus bars of Shahtaj PP 132 kV, Shahtaj 11kV, Phalia, Mandi Bahaudin, Head faqiran and Helan are plotted. The results show quick recovery of the voltages after clearing of fault.

Fig. 3.2 Frequency

We see the system frequency recovers back to normal quickly after fault clearance.

Fig. 3.3 MW/MVAR Output of Generators of Shahtaj PP

The pre-fault output of Shahtaj PP gets back to the same output quickly after fast damping of the oscillations in its output. However MVAR output acquires equilibrium at a new value.

Fig. 3.4 Speed and mechanical power of Generators at Shahtaj PP



The speed deviation of the generator, after clearing fault, damps down quickly returning to normal speed as of before fault. The transients in mechanical power also damp quickly and settle to a new equilibrium.

Fig. 3.5 MW/MVAR Flow on Shahtaj PP 132/11 kV single transformer

Followed by clearing of fault, the trip of Shahtaj 132/11 kV single transformer causes all power to flow on the intact 132/11 kV single transformer. We plotted the flows of MW and MVAR on this intact circuit and see that the power flows on this circuit attains to steady state level with power swings damping down fast.

Fig. 3.6 Rotor Angles

The rotor angles of the generators of Shahtaj LV 11 kV, Mangla 132 kV, New Bong Escape 132 kV, G.Brotha 132 kV, Allai 220 kV are plotted relative to machines at Allai 220 kV. The results show that the rotor angle of Shahtaj PP gets back after the first swing and damps down quickly. Similarly the rotor angles of other machines swing little after the fault and damp fast after clearing of fault. The system is strongly stable and very strong in damping the post fault oscillations.

7.2.4 Fault at 132 kV Mandi Bhaudin

We applied three-phase fault on 132 kV bus bar of Mandi Bhaudin to study the impact of a disturbance in the grid on the performance of the plant. The fault is cleared in 5 cycles (100 ms) as standard clearing time for 132 kV systems, followed by trip of 132 kV single circuit between Mandi Bhaudin and Helan 132kV. We monitored different quantities for one second pre-fault and nine cycles after clearance of fault (post-fault) conditions and plotted the results attached in Appendix – E and discussed as follows:

Fig. 4.1 Bus Voltages

The bus voltages of 132 kV bus bars of Shahtaj PP 132 kV, Shahtaj 11kV, Phalia, Mandi Bhaudin, Head faqiran and Helan are plotted. The results show quick recovery of the voltages after clearing of fault.

Fig. 4.2 Frequency

We see the system frequency recovers back to normal quickly after fault clearance.

Fig. 4.3 MW/MVAR Output of Generators of Shahtaj PP



The pre-fault output of Shahtaj PP gets back to the same output quickly after fast damping of the oscillations in its output. However MVAR output acquires equilibrium at a new value.

Fig. 4.4 Speed and mechanical power of Generators at Shahtaj PP

The speed deviation of the generator, after clearing fault, damps down quickly returning to normal speed as of before fault. The transients in mechanical power also damp quickly and settle to a new equilibrium.

Fig. 3.5 MW/MVAR flow on M.B.Din to Phalia 132 kV circuit

Followed by clearing of fault, the trip of a 132 kV single circuit from M.B.Din to Helan causes significant increase in the flow on the intact 132 kV circuit between M.B.Din and Phalia. We plotted the flows of MW and MVAR on this intact circuit and see that the power flows on this circuit attains to steady state level with power swings damping down fast.

Fig. 3.6 Rotor Angles

The rotor angles of the generators of Shahtaj LV 11 kV, Mangla 132 kV, New Bong Escape 132 kV, G.Brotha 132 kV, Allai 220 kV are plotted relative to machines at Allai 220 kV. The results show that the rotor angle of Shahtaj PP gets back after the first swing and damps down quickly. Similarly the rotor angles of other machines swing little after the fault and damp fast after clearing of fault. The system is strongly stable and very strong in damping the post fault oscillations.

7.3 Dynamic Stability Simulations' Results – January 2022

7.3.1 Fault at 132 kV Shahtaj Power Plant

We applied three-phase fault on 132 kV bus bar of Shahtaj-PP to study the impact of a disturbance in the grid on the performance of the plant. The fault is cleared in 5 cycles (100 ms) as standard clearing time for 132 kV systems, followed by trip of 132 kV single circuit between Shahtaj PP and M.B.Din. We monitored different quantities for one second pre-fault and nine seconds after clearance of fault (post-fault) conditions and plotted the results attached in Appendix – E and discussed as follows:



Fig. 1.1 Bus Voltages

The bus voltages of 132 kV bus bars of Shahtaj PP 132 kV, Shahtaj 11kV, Phalia, Mandi Bahaudin, Head faqiran and Helan are plotted. The results show quick recovery of the voltages after clearing of fault.

Fig. 1.2 Frequency

We see the system frequency recovers back to normal quickly after fault clearance.

Fig. 1.3 MW/MVAR Output of Generators of Shahtaj PP

The pre-fault output of Shahtaj PP gets back to the same output quickly after fast damping of the oscillations in its output. However MVAR output acquires equilibrium at a new value.

Fig. 1.4 Speed and mechanical power of Generators at Shahtaj PP

The speed deviation of the generator, after clearing fault, damps down quickly returning to normal speed as of before fault. The transients in mechanical power also damp quickly and settle to a new equilibrium.

Fig. 1.5 MW/MVAR Flow on Shahtaj PP to M.B.Din 132 kV intact circuit

Followed by clearing of fault, the trip of a 132 kV single circuit from Shahtaj PP to M.B.Din causes significant increase in the flow on the intact 132 kV circuit between Shahtaj PP to Mandi Bahaudin. We plotted the flows of MW and MVAR on this intact circuit and see that the power flows on this circuit attains to steady state level with power swings damping down fast.

Fig. 1.6 Rotor Angles

The rotor angles of the generators of Shahtaj LV 11 kV, Mangla 132 kV, New Bong Escape 132 kV, G.Brotha 132 kV, Allai 220 kV are plotted relative to machines at Allai 220 kV. The results show that the rotor angle of Shahtaj PP gets back after the first swing and damps down quickly. Similarly the rotor angles of other machines swing little after the fault and damp fast after clearing of fault. The system is strongly stable and very strong in damping the post fault oscillations.



7.3.2 Fault at 132 kV Shahtaj Power Plant (Stuck Breaker)

We applied three-phase fault on 132 kV bus bar of Shahtaj PP to study the impact of a disturbance in the grid on the performance of the plant. The fault is cleared in 9 cycles (180 ms) that is the clearing time for stuck breaker case for 132 kV systems, followed by trip of 132 kV single circuit between Shahtaj PP and M.B.Din. We monitored different quantities for one second pre-fault and nine seconds after clearance of fault (post-fault) conditions and plotted the results attached in Appendix – E and discussed as follows:

Fig. 2.1 Bus Voltages

The bus voltages of 132 kV bus bars of Shahtaj PP 132 kV, Shahtaj 11kV, Phalia, Mandi Bahaudin, Head faqiran and Helan are plotted. The results show quick recovery of the voltages after clearing of fault.

Fig. 2.2 Frequency

We see the system frequency recovers back to normal quickly after fault clearance.

Fig. 2.3 MW/MVAR Output of Generators of Shahtaj PP

The pre-fault output of Shahtaj PP gets back to the same output quickly after fast damping of the oscillations in its output. However MVAR output acquires equilibrium at a new value.

Fig. 2.4 Speed and mechanical power of Generators at Shahtaj PP

The speed deviation of the generator, after clearing fault, damps down quickly returning to normal speed as of before fault. The transients in mechanical power also damp quickly and settle to a new equilibrium.

Fig. 2.5 MW Flow on Shahtaj PP to M.B.Din 132 kV circuit

Followed by clearing of fault, the trip of a 132 kV single circuit from Shahtaj PP to M.B.Din causes significant increase in the flow on the intact 132 kV circuit between Shahtaj PP to Mandi Bahaudin. We plotted the flows of MW and MVAR on this intact circuit and see that the power flows on this circuit attains to steady state level with power swings damping down fast.

Fig. 2.6 Rotor Angles

The rotor angles of the generators of Shahtaj LV 11 kV, Mangla 132 kV, New Bong Escape 132 kV, G.Brotha 132 kV, Allai 220 kV are plotted relative to machines at Allai



220 kV. The results show that the rotor angle of Shahtaj PP gets back after the first swing and damps down quickly. Similarly the rotor angles of other machines swing little after the fault and damp fast after clearing of fault. The system is strongly stable and very strong in damping the post fault oscillations.

7.3.3 Fault at 11 kV Shahtaj Power Plant (9 cycles Fault)

We applied three-phase fault on 11 kV bus bar of Shahtaj PP to study the impact of a disturbance in the grid on the performance of the plant. The fault is cleared in 9 cycles (180 ms) as standard clearing time for 11 kV systems, followed by trip of Shahtaj 132/11kV Single Transformer. We monitored different quantities for one second pre-fault and nine seconds after clearance of fault (post-fault) conditions and plotted the results attached in Appendix -- E and discussed as follows:

Fig. 3.1 Bus Voltages

The bus voltages of 132 kV bus bars of Shahtaj PP 132 kV, Shahtaj 11kV, Phalia, Mandi Bahaudin, Head faqiran and Helan are plotted. The results show quick recovery of the voltages after clearing of fault.

Fig. 3.2 Frequency

We see the system frequency recovers back to normal quickly after fault clearance.

Fig. 3.3 MW/MVAR Output of Generators of Shahtaj PP

The pre-fault output of Shahtaj PP gets back to the same output quickly after fast damping of the oscillations in its output. However MVAR output acquires equilibrium at a new value.

Fig. 3.4 Speed and mechanical power of Generators at Shahtaj PP

The speed deviation of the generator, after clearing fault, damps down quickly returning to normal speed as of before fault. The transients in mechanical power also damp quickly and settle to a new equilibrium.

Fig. 3.5 MW/MVAR Flow on Shahtaj PP 132/11 kV single transformer

Followed by clearing of fault, the trip of Shahtaj 132/11 kV single transformer causes all power to flow on the intact 132/11 kV single transformer. We plotted the flows of MW and MVAR on this intact circuit and see that the power flows on this circuit attains to steady state level with power swings damping down fast.



Fig. 3.6 Rotor Angles

The rotor angles of the generators of Shahtaj LV 11 kV, Mangla 132 kV, New Bong Escape 132 kV, G.Brotha 132 kV, Allai 220 kV are plotted relative to machines at Allai 220 kV. The results show that the rotor angle of Shahtaj PP gets back after the first swing and damps down quickly. Similarly the rotor angles of other machines swing little after the fault and damp fast after clearing of fault. The system is strongly stable and very strong in damping the post fault oscillations.

7.3.4 Fault at 132 kV Mandi Bhaudin

We applied three-phase fault on 132 kV bus bar of Mandi Bhaudin to study the impact of a disturbance in the grid on the performance of the plant. The fault is cleared in 5 cycles (100 ms) as standard clearing time for 132 kV systems, followed by trip of 132 kV single circuit between Mandi Bhaudin and Helan 132kV. We monitored different quantities for one second pre-fault and nine cycles after clearance of fault (post-fault) conditions and plotted the results attached in Appendix – E and discussed as follows;

Fig. 4.1 Bus Voltages

The bus voltages of 132 kV bus bars of Shahtaj PP 132 kV, Shahtaj 11kV, Phalia, Mandi Bhaudin, Head faqiran and Helan are plotted. The results show quick recovery of the voltages after clearing of fault.

Fig. 4.2 Frequency

We see the system frequency recovers back to normal quickly after fault clearance.

Fig. 4.3 MW/MVAR Output of Generators of Shahtaj PP

The pre-fault output of Shahtaj PP gets back to the same output quickly after fast damping of the oscillations in its output. However MVAR output acquires equilibrium at a new value.

Fig. 4.4 Speed and mechanical power of Generators at Shahtaj PP

The speed deviation of the generator, after clearing fault, damps down quickly returning to normal speed as of before fault. The transients in mechanical power also damp quickly and settle to a new equilibrium.

Fig. 3.5 MW/MVAR flow on M.B.Din to Phalia 132 kV circuit



Followed by clearing of fault, the trip of a 132 kV single circuit from M.B.Din to Helan causes significant increase in the flow on the intact 132 kV circuit between M.B.Din and Phalia. We plotted the flows of MW and MVAR on this intact circuit and see that the power flows on this circuit attains to steady state level with power swings damping down fast.

Fig. 3.6 Rotor Angles

The rotor angles of the generators of Shahtaj LV 11 kV, Mangla 132 kV, New Bong Escape 132 kV, G.Brotha 132 kV, Allai 220 kV are plotted relative to machines at Allai 220 kV. The results show that the rotor angle of Shahtaj PP gets back after the first swing and damps down quickly. Similarly the rotor angles of other machines swing little after the fault and damp fast after clearing of fault. The system is strongly stable and very strong in damping the post fault oscillations.

7.4 Conclusion of Dynamic Stability Analysis

The results of dynamic stability show that the system is very strong and stable for the proposed scheme for the severest possible faults of 132 kV systems near to and far of Shahtaj Sugar Mills. Therefore there is no problem of dynamic stability for interconnection of Shahtaj Sugar Mills; it fulfills all the criteria of dynamic stability.



8. Conclusions

- ❖ The Final Report of Interconnection of the 32 MW Shahtaj Sugar Mill limited for the supply of 15 MW to the GEPCO grid system is submitted herewith.
- ❖ The study objective, approach and methodology of this final report have been described and the plant's data received from the Client is validated.
- ❖ The updated GEPCO/NTDC system data as available with PPI for other studies have been used with latest load forecast and system expansion plans of NTDC and GEPCO.
- ❖ The nearest grids is 132 kV Mandi Bahaudin Grid Station as shown in Sketch-1 in Appendix-B.
- ❖ The interconnection of 32 MW Shahtaj Sugar Mill (15 MW Spill Over to the GEPCO system) is proposed by connecting a 132 kV double circuit from Mandi Bahaudin, approximately 1 km, using Rail conductor. The scheme has been developed after confirmation with GEPCO. The scheme is shown in Sketch-2 in Appendix-B.
- ❖ The planned COD of Shahtaj PP after confirmation from Shahtaj Sugar Mills is January 2017. The above proposed interconnection scheme has been tested for steady state conditions through detailed load flow studies for the peak load conditions of January 2017 for maximum thermal power dispatches in the grid. The system conditions of normal and N-1 contingency have been studied to meet the reliability criteria of NEPRA Grid Code.
- ❖ Steady state analysis by load flow for peak load of January 2017 reveals that the proposed scheme is adequate for the supply 15 MW Spillover of the Plant to the GEPCO system, under normal as well as contingency conditions. Steady state analysis by load flow for peak load of January 2017 as well as future case of January 2022 is also studied to evaluate the impact on the FESCO and IESCO network and it was found that the proposed scheme is adequate for the supply 15 MW Spillover of the Plant to the GEPCO system, under normal as well as contingency conditions.



- ❖ The proposed scheme of interconnection has no technical constraints or problems, it fulfills all the criteria of reliability and under steady state load flow and contingency load flows; and is therefore recommended to be adopted.
- ❖ The short circuit analysis has been carried out to calculate maximum fault levels at Shahtaj PP and the substations of 132kV in its vicinity. We find that the fault currents for the proposed scheme are within the rated short circuit capacities of switchgear installed at these substations. There are no violations of exceeding the rating of the equipment due to contribution of fault current from Shahtaj PP.
- ❖ The maximum short circuit level of Shahtaj 11 kV bus bar in 2017 is 32.84 kA and 30.13 kA and in 2022 the values are 37.17 kA and 34.73 kA for 3-phase and 1-phase faults respectively. It would be advisable to go for standard size switchgear of short circuit rating of 40 kA. It would provide a margin for any future increase in short circuit levels due to future generation additions and network reinforcements in this area.
- ❖ The dynamic stability analysis of proposed scheme of interconnection has been carried out. The stability check for the worst case of three phase fault right on the 132 kV bus bar of Shahtaj PP substation followed by the final trip of 132 kV circuits emanating from this substation, has been performed for fault clearing of 5 cycles (100 ms) as understood to be the normal fault clearing time of 132 kV protection system and for 9 cycles (180 ms) which represents the stuck breaker case in which the backup protection acts to isolate the fault.
- ❖ The proposed scheme of interconnection has no technical constraints or problems, it fulfills all the criteria of reliability and under steady state load flow and contingency load flows; and is therefore recommended to be adopted.



No.

In the Office of the ASSISTANT REGISTRAR OF COMPANIES UNDER

ACT VII OF 1913.

IN THE MATTER OF PASRUR SUGAR MILLS LIMITED.

I do hereby certify that pursuant to the provisions of section II, sub-section (5), Act, VII, 1913 (The Companies Act, 1913), and under order of the Government of West Pakistan, Industries Commerce & M. R. Deptt., conveyed by their Memo No. IV-12-58/65

Department

dated the 26th May, 1966

to the address of The Registrar, Joint Stock Companies, West Pakistan and a copy endorsed to this office vide Registrar Endorsement No. RWP/11/896/760 dated 28th May, 1966.

the name of Pasrur Sugar Mills Limited.

has this day been changed to Shahtaj Sugar Mills Ltd.

and that the said Company has been duly incorporated as a Company under the provisions of the said Act.

Dated this Twentyninth day of June One thousand Nine hundred and Sixty-Six.

Sd:-

(MUZAFFAR AHMAD)
Assistant Registrar,
Joint Stock Companies,
Karachi Region, Karachi.

J.S.C. 39.

"A"

No. R. 69—CCI/65

Government of Pakistan
MINISTRY OF FINANCE
OFFICE OF THE CONTROLLER OF CAPITAL ISSUES

From: Islamabad, the 8th June, 1965.

The Controller of Capital Issues.

To:

Messrs. Surridge & Beecheno,
Advocates & Solicitors, Finlay House, McLeod Road,
KARACHI-2.

Dear Sirs:

With reference to your letter No. T-620/CT/R, dated the 4th May, 1965, I am directed to say that, subject to the conditions stated hereinafter and on the back hereof and subject to the reduction mentioned in the next succeeding paragraph of this letter, the Central Government are pleased to give their consent under the Capital Issues (Continuance of Control) Act, 1947, to the proposed issue in Pakistan by a Public company M/s. Pasnur Sugar Mills Ltd., proposed to be registered in Karachi of capital to the value of Rs. 1,50,00,000/- (Rupees One crore fifty lakhs only) divided into 1,5,00,000 ordinary shares of Rs. 10/- each to be issued at par which should be offered as follows:-

i) Shares of Rs. 24 lakhs may be offered to the Cane-growers excluding the directors and their friends if they happen to be Cane-growers; and (ii) Shares of Rs. 36 lakhs*

2. The amount by which this issue shall be reduced is the amount of any securities issued by the company under the Ministry of Finance, Controller of Capital Issue Exemption Order No. F. 2 (I)CCI/51, dated the 30th October, 1951, and No. F.6 (7) CCI/59, dated 2nd November, 1959.

3. I am to make it quite clear that the grant of consent to this issue of capital represents no commitment of any kind on the part of the Central Government to render assistance in the matter of priorities or licences for supplies of raw materials, machinery, steel, etc., of transport facilities and of other Governmental assistance, including the provision of foreign exchange.

* be offered to the general public (other than Cane-growers) and shares of Rs. 30 lakhs to the National Investment Trust Ltd., Karachi.

Yours truly,
Sd/
CONTROLLER OF CAPITAL ISSUES

Copy forwarded for information to:-

- (i) The Assistant Registrar of Joint Stock Companies, Karachi.
- (ii) State Bank of Pakistan, Exchange Control Department, Central Directorate, Karachi.
- (iii) National Investment Trust Ltd., Shahrah-e-Kamal Atatürk, Karachi.

CONDITIONS

1. In any prospectus or other documents referred to in section 4 of Capital Issues (Continuance of Control) Act 1947, the statement required by that section must be worded as follows:-

"Consent of the Central Government has been obtained to the issue of capital under the Capital Issues (Continuance of Control) Act 1947, by an order of which a complete copy is open to public inspection at the head office of the company. It must be distinctly understood that in giving this consent the Central Government does not take any responsibility for the financial soundness of any scheme or for the correctness of any of the statements made or opinion expressed with regard to them."

N.B. It is not permissible to abbreviate this form of statement.

2. The authority conveyed in this letter will lapse on the expiry of twelve months from the date of issue of the letter. Within one month of the date when the authority so lapses, the company must forward to the Controller of Capital Issues a report of the action taken under the authority and of the amount of capital subscribed and paid-up as a result of such action.

3. This letter must be produced at the time of the presentation of documents for registration or stamping.

4. The proceeds of the issue of capital hereby sanctioned must not, without the prior permission of the Central Government in writing, be used for any objects of expenditure other than those described in the application to which this order relates.

5. The company will be subject to any measures of control, licensing or acquisition that may be brought into operation either by the Central or a Provincial Government.

6. Your attention is drawn to the provisions of Section 13 (1) (b) of the Foreign Exchange Regulation Act, 1947, which prescribes *inter alia*, that no person shall, without the special permission of the State Bank of Pakistan, transfer any security or create (i.e. issue) or transfer any interest in a security to or in favour of a person resident outside Pakistan. A person resident outside Pakistan includes a foreign national for the time being resident in Pakistan. The company should ensure before allotting shares to non-nationals of Pakistan, or transferring shares already issued, to the names of non-nationals, that they have obtained the prior permission of the State Bank of Pakistan under the Foreign Exchange Regulation Act. The company, therefore, is required to ask all the applicants, for allotment/transfer of shares, to declare their nationality in their application and direct those who are non-nationals of Pakistan to produce the permission of the State Bank of Pakistan before any allotment/transfer of shares is made.

7. The remuneration of the Managing Agents/Director should not exceed:-

(i) (a) Rs. 3,500/- (Rupees three thousand five hundred only) per mensem as office allowance and

(b) 5% (Five per cent) of the net annual profits of the company, as defined in section 87-C (3) of the Companies Act, 1913, as commission. Provided that the abovementioned remuneration shall be suitably reduced if the amount of capital raised during the prescribed period falls short of the amount sought to be raised and in the opinion of the Government of Pakistan the shortfall necessitates such a reduction.

- (ii) The Managing Agents should not be appointed for a period exceeding 5 years (five years) under the Managing Agency Agreement.
- (iii) The Managing Agents shall nominate only one director on the Board of Directors of the managed company.
8. The remuneration of a Director shall not exceed Rs. 100.00 (Rupees One Hundred only) per meeting of the Board attended by him. The remuneration of a Director for performing extra services shall be subject to the approval of the company in General Meeting (not Board of Directors). If the payment for extra services is to be made in the form of commission fixed as a percentage of profits, it will be subject to prior approval of the Controller of Capital Issues.
9. The quorum of Directors meeting should consist of at least 3 Directors present in person. If all the Directors except one are disqualified from voting, the matter should be decided in the General Meeting.
10. The quorum of General Meeting should consist of at least 5 persons present in person or by proxy.
11. Brokerage and Underwriting Commission should not exceed 1% and 1-1/2% (One per cent and One and a half per cent) respectively of the capital paid up.
12. The compensation payable to the Managing Agents on premature termination of the Agreement should be calculated at the rate of one year's average remuneration for every four years of the unexpired period of the Agreement.
13. The qualification of a Director and *ex-officio* Director shall be his holding shares to the value of Rs. 25,000/- (Rupees twenty five thousand) at least in his own name, relaxable in the case of Directors representing interest holding shares of the requisite value. In case of *ex-officio* Director the Managing Agents may themselves hold the share qualification of Rs. 25,000/- per Director nominated by them.
14. The shares should not be issued in lots.
15. After deducting shares subscribed by the National Investment Trust Ltd., the basis of allotment of shares to the general public should be as follows:-
- (a) 50% (Fifty per cent) to the applicants of and up to 100 shares on a flat rate basis.
 - (b) The remainder of the shares on a flat rate basis amongst applicants who have applied for more than 100 shares.
16. The company shall furnish to the Controller of Capital Issues a copy of the draft prospectus for his approval before it is released to Press for publication.
17. The company should also submit a copy of the Annual Statement of Accounts and a copy of the Directors speech every year.
18. The company should submit quarterly reports regarding the progress made for issuing capital.
19. A copy of this Consent Order should be published in the Memorandum and Articles of Association like a Certificate of incorporation.
20. Articles of Association of the Company and the Agreement with the Managing Agents should be amended accordingly.
21. The company shall furnish to the Controller of Capital Issues the basis of the allotment of shares.

22. At least 60% (sixty percent) of the capital i.e. Rs. 90,00,000/- (Rupees Ninety Lakhs) shall be offered at par to the Cane-growers and the general public including 20% (twenty percent) i.e. Rs. 30,00,000/- (Rupees thirty lakhs) to the National Investment Trust Ltd. Any part of the shares offered to the National Investment Trust Ltd. and not picked up by them may be offered to the general public at par.

N.B.- If action is taken in pursuance of this consent and if a company subsequently violates any condition attached to the Consent, an offence will be committed under section 13 of the said Act.

Signed:

CONTROLLER OF CAPITAL ISSUES.

In supersession of the Ministry's Consent Order
No. R. 69-CCI/65, dated the 8th June, 1965.

"A"

No. R. 18-CCI/66
Government of Pakistan
MINISTRY OF FINANCE
OFFICE OF THE CONTROLLER OF CAPITAL ISSUES

Islamabad, the 28th Feb., 1966.

From:

The Controller of Capital Issues.

To:

The Chairman,
Pasrur Sugar Mills Ltd.,
C/o. Shahnawaz Corporation Ltd.,
19, West Wharf Road, KARACHI-2.

Dear Sir,

With reference to your letter No. S. N. 5, dated 15th January, 1966. I am directed to say that, subject to the conditions stated hereinafter and on the back hereof and subject to the reduction mentioned in the next succeeding paragraph of this letter, Central Government are pleased to give their consent under the Capital Issues (Continuance of Control) Act, 1947, to the proposed issue in Pakistan by a Public Company M/s. Pasrur Sugar Mills Ltd. registered in Karachi of Capital to the value of Rs. 1,75,00,000/- (Rupees one Crore Seventyfive lakhs only) as follows, viz: 17,50,000 ordinary shares of Rs. 10/- each to be issued at par as follows:—

- (i) Shares of Rs. 28 lacs shall be offered to the Cane-growers excluding the directors and their friends if they happen to be Cane-growers, and
- (ii) Shares of Rs. 42 lacs shall be offered to the general public (other than Cane-growers) and shares of Rs. 35 lacs to the National Investment Trust Ltd., Karachi.
- (iii) Shares to the value of Rs. 38,00,000/- and Rs. 32,00,000/- shall be offered to the Shahnawaz Group and Cowasjee Group respectively.

2. The amount by which this issue shall be reduced is the amount of any securities issued by the Company under the Ministry of Finance, Controller of Capital Issues Exemption Order No. F.2 (i) CCI/51, dated the 30th Oct. 1951, and No. F. 6(7) CCI/59, dated the 2nd November, 1959.

3. I am to make it quite clear that the grant of consent to this issue of capital represents no commitment of any kind on the part of the Central Government to render assistance in the matter of priorities or licences for supplies of raw materials, machinery, Steel, etc., of transport facilities and of other Governmental assistance, including the provision of foreign exchange.

Yours truly,
Sd/-

CONTROLLER OF CAPITAL ISSUES.

Copy forwarded for information to:—

- (i) The Assistant Registrar of Joint Stock Companies, Karachi.
- (ii) The State Bank of Pakistan, Exchange Control Department, Central Directorate, Karachi
- (iii) National Investment Trust Ltd., Shahrah-e-Kamal Atatürk, Karachi.

CONDITIONS

1. In any prospectus or other documents referred to in Section 4 of Capital Issues (Continuance of Control) Act, 1947, the statement required by that section must be worded as follows:-

"Consent of the Central Government has been obtained to the issue of capital under the Capital Issues (Continuance of Control) Act, 1947, by an order of which a complete copy is open to public inspection at the head office of the company. It must be distinctly understood that in giving this consent the Central Government does not take any responsibility for the financial soundness of any scheme or for the correctness of any of the statements made or opinion expressed with regard to them".

N.B.-It is not permissible to abbreviate this form of statement.

2. The authority conveyed in this letter will lapse on the expiry of twelve months from the date of issue of the letter. Within one month of the date when the authority so lapses, the company must forward to the Controller of Capital Issues a report of the action taken under the authority and of the amount of capital raised as a result of such action.

3. This letter must be produced at the time of the presentation of documents for registration or stamping.

4. The proceeds of the issue of capital hereby sanctioned must not without the prior permission of the Central Government in writing be used for any objects of expenditure other than described in the application to which this order relates.

5. The company will be subject to any measures of control licensing or acquisition that may be brought into operation either by the Central or Provincial Government.

6. Your attention is drawn to the provisions of Section 13 (I) (b) of the Foreign Exchange Regulation Act, 1947, which prescribes, *inter alia* that no person shall, without the special permission of the State Bank of Pakistan, transfer any security or create (i.e. issue) or transfer any interest in a security to or in favour of a person resident outside Pakistan. A person resident outside Pakistan includes a foreign national for the time being resident in Pakistan. The company should ensure before allotting shares to non-nationals of Pakistan, or transferring shares already issued, to the names of non-nationals, that they have obtained the prior permission of the State Bank of Pakistan under the Foreign Exchange Regulation Act. The company, therefore, is required to ask all the applicants, for allotment/transfer of shares, to declare their nationality, in their application and direct those who are non-nationals of Pakistan to produce the permission of the State Bank of Pakistan before any allotment/transfer of shares is made.

7. The remuneration of the Managing Agents should not exceed:-

(i) (a) Rs. 3,500/- (Rupees Three thousand five hundred only) per mensem as office allowance and

(b) 5% (five per cent) of the net annual profits of the company, as defined in section 87-C (3) of the Companies Act, 1913, as commission. Provided that the abovementioned remuneration shall be suitably reduced if the amount of capital raised during the prescribed period falls short of the amount sought to be raised and in the opinion of the Government of Pakistan the shortfall necessitates such a reduction.

(ii) The Managing Agents should not be appointed for a period exceeding 10 years under the Managing Agency Agreement.

- (iii) The Managing Agents shall nominate only one director on the Board of Directors of the managed company.

8. The remuneration of a Director shall not exceed Rs. 100/- (Rupees One Hundred only) per meeting of the Board attended by him. The remuneration of a Director for performing extra services shall be subject to the approval of the company in General Meeting (not Board of Directors). If the payment for extra services is to be made in the form of commission fixed as a percentage of profits, it will be subject to prior approval of the Controller of Capital Issues.

9. The quorum of Directors meeting should consist of at least 3 Directors present in person. If all the Directors except one are disqualified from voting, the matter should be decided in the General Meeting.

10. The quorum of General Meeting should consist of at least 5 persons present in person or by proxy.

11. Brokerage and Underwriting Commission should not exceed 1% and 1-1/2% (One per cent and One and a half per cent) respectively of the capital paid up.

12. The compensation payable to the Managing Agents on premature termination of the Agreement should be calculated at the rate of one year's average remuneration for every four years of the unexpired period of the Agreement.

13. The qualification of a Director and *ex-officio* Director shall be his holding shares to the value of Rs. 25,000/- (Rupees Twenty-five thousand) at least in his own name, relaxable in the case of Directors representing interest holding shares of the requisite value. In case of *ex-officio* Director the Managing Agents may themselves hold the share qualification of Rs. 25,000/- per Director nominated by them.

14. The shares should not be issued in lots.

15. The company shall furnish to the Controller of Capital Issues a copy of the draft prospectus for his approval before it is released to the Press for publication.

16. The company should also submit a copy of the Annual Statement of Accounts and a copy of the Directors speech every year.

17. The company should submit quarterly reports regarding the progress made for issuing capital.

18. A copy of this Consent Order should be published in the Memorandum and Articles of Association like a Certificate of Incorporation.

19. Articles of Association of the Company and the Agreement with the Managing Agents should be amended accordingly.

20. The company shall furnish to the Controller of Capital issues the basis of the allotment of shares.

21. At least 60% (Sixty percent) of the capital i.e. Rs. 1,05,00,000/- (Rupees One Crore Five Lakhs) shall be offered at par to the Cane-growers and the general public including 20% (twenty per cent) i.e. Rs. 35,00,000/- (Rupees Thirty Five Lakhs) to the National Investment Trust Ltd. Any part of the shares offered to the National Investment Trust Ltd., and not picked up by them may be offered to the general public at par.

22. After deducting shares subscribed by the National Investment Trust Limited, the basis of allotment of shares to the general public should be as follows:-

- (a) The applicants of and upto 100 shares should be accommodated fully if the capital to be issued to the general public is sufficient for the purpose. If the capital applied for is in excess of the capital to be issued to the general public, the distribution may be made on the prorata basis; and
- (b) Any capital left after allotment to applicants mentioned in (a) above should be distributed to persons who apply for more than 100 shares on a flat rate basis.

N.B.- If action is taken in pursuance of this consent and if a company subsequently violates any condition attached to the Consent an offence will be committed under section 13 of the said Act.

Signed:

CONTROLLER OF CAPITAL ISSUES.

No. R.18-CCI/66
Government of Pakistan
MINISTRY OF FINANCE
OFFICE OF THE CONTROLLER OF CAPITAL ISSUES.

Islamabad, the 8th February, 1967.

From: The Controller of Capital Issues.

To: The Managing Agents,
Shahtaj Sugar Mills Ltd.,
19, West Wharf Road, Karachi-2

Subject:—Revalidation of the Consent Order —
M/s. Shahtaj Sugar Mills Limited —

Dear Sir,

With reference to your letter No. MMS: 15, dated the 26th January, 1967, I am directed to say that the Central Government are pleased to extend till the 28th August, 1967, the period allowed for the issue of capital by their order conveyed to you in this Office letter No. R. 18-CCI/66, dated the 28th February, 1966, subject to the following conditions :—

- (1) After deducting shares subscribed by the National Investment Trust Limited, the basis of allotment of shares to the general public should be as follows:—
 - (a) The applicants of and upto 100 shares should be accommodated fully if the capital to be issued to the general public is sufficient for the purpose. If the capital applied for by such applicants is in excess of the capital offered to the general public, the distribution may be made in such manner as may be determined by the Controller of Capital Issues.
 - (b) Any capital left after allotment to applicants mentioned in (a) above should be distributed to persons who apply for more than 100 shares on a flat rate basis.
 - (2) The total of the remuneration of the Managing Agents in any form (exclusive of monthly office allowance) in any year shall not in term of percentage of profits exceed the rate at which dividend is paid to the shareholders for that year.
 - (3) The Managing Agents should not be entitled to any remuneration from the managed company for making sales or purchases of the managed company, nor any sales or purchase agency etc., should be created without the prior approval of the Controller of Capital Issues.
 - (4) During the tenure of the Managing Agency the company should not appoint any Chief Executive, viz., Chairman, Managing Director, or Governing Director on remuneration. The terms of appointment of such Chief Executive after the expiry of the Managing Agency tenure will be subject to the prior approval of the Controller of Capital Issues.
2. This letter should be produced to the Assistant Registrar of Joint Stock Companies, Karachi.

Yours truly,

CONTROLLER OF CAPITAL ISSUES.

Copy forwarded for information to :—

1. The Assistant Registrar of Joint Stock Companies, Karachi.
2. The State Bank of Pakistan, Exchange Control Deptt, Central Directorate, Karachi.

REGISTERED

No. R. 185-CCI/68

GOVERNMENT OF PAKISTAN

MINISTRY OF FINANCE

(Office of the Controller of Capital Issues)

Islamabad the 13th January, 1969.

From

The Controller of Capital Issues

To

M/s. Shahtaj Sugar Mills Limited,
19, West Wharf Road,
P.O. Box No. 4766,
Karachi.

Dear Sir/Sirs,

With reference to your letter No. SSM : 16-E/2568 dated the 26-11-1968 I am directed to say that subject to the conditions stated herein after and on the back, hereof, the Central Government are pleased to give their consent under the Capital Issues (Continuance of Control) Act 1947, to the proposed issue in Pakistan by M/s. Shahtaj Sugar Mills Limited a public company registered in Karachi of capital to the value of Rs. 30,00,000/- (Rupees Thirty Lacs) divided into 3,00,000 Ordinary Shares of Rs.10/- each to be issued at par to the Pakistan Industrial Credit and Investment Corporation.

2. This amount is in addition to the capital of Rs. 1,75,00,000/- already issued by the company.

3. I am to make it quite clear that the grant of consent to this issue of capital represents no commitment of any kind on the part of the Central Government to render assistance in the matter of priorities or licences for supplies of raw materials, machinery steel, etc., of transport facilities and of other Government assistance, including the provision of foreign exchange.

Yours truly,

(H. U. Beg)
Controller of Capital Issues.

CONDITIONS

1. In any prospectus or other documents referred to in section 4 of Capital Issues (Continuance of Control) Act, 1947 the statement required by that section must be worded as follows:

"Consent of the Central Government has been obtained to the issue of capital under the Capital Issues (Continuance of Control) Act, 1947, by an order of which a complete copy is open to public inspection at the head office of the company. It must be distinctly understood that in giving this consent the Central Government does not take any responsibility for the financial soundness of any scheme or for the correctness of any of the statements made or opinion expressed with regard to them".

N.B.-It is not permissible to abbreviate this form of statement.

2. The authority conveyed in this letter will lapse on the expiry of twelve months from the date of issue of the letter. Within one month of the date when the authority so lapses, the company must forward to the Controller of Capital Issues a report of the action taken under the authority and of the amount of capital raised as a result of such action.

3. This letter must be produced at the time of the presentation of documents for registration or stamping.

4. The proceeds of the issue of capital hereby sanctioned must not without the prior permission of the Central Government in writing be used for any objects of expenditure, other than those described in the application to which this order relates.

5. The company will be subjected to any measures of control licensing or acquisition that may be brought into operation either by the Central or a Provincial Government.

6. Your attention is drawn to the provisions of section 13 (l) (b) of the Foreign Exchange Regulation Act, 1947, which prescribes, inter alia, that no person shall without the special permission of the State Bank of Pakistan, transfer any security or create (i.e. issue) or transfer any interest in a security to or in favour of a person resident outside Pakistan. A person resident out-side Pakistan includes a foreign national for the time being resident in Pakistan. The company should ensure before allotting shares to non-nationals of Pakistan or transferring shares already issued, to the names of non-nationals, that they have obtained the prior permission of the State Bank of Pakistan under the Foreign Exchange Regulation Act. The company, therefore is required to ask all the applicants, for allotment/transfer of shares, to declare their nationality, in their application and direct those who are non-national of Pakistan to produce the permission of the State Bank of Pakistan before any allotment/transfer of shares is made.

7. The terms of the Managing Agents will be governed by the Conditions enumerated in this Ministry's Consent Order No. R. 18-CCI/66 dated 28th February, 1966 and the letter of even number, dated 8th February, 1967.

(H. U. Beg)
Controller of Capital Issues

8. The remuneration of a Director shall not exceed Rs. 100/- (Rupees One hundred) per meeting of the Board attended by him. The remuneration of a Director for performing extra services shall be subject to the prior approval of the company in General Meeting (not Board of Directors.) If the payment for extra services is to be made in the form of commission fixed as a percentage of profits, it will be subject to prior approval of the Controller of Capital Issues.

9. The quorum of Directors meeting should consist of at least 3 Directors present in person. If all the Directors except one are disqualified from voting the matter should be decided in the General Meeting.

10. The quorum of General Meeting should consist of at least 5 persons present in person or by proxy.

11. The qualification of a Director and ex-officio Director shall be his holding shares to the value of Rs. 25,000/- (Rupees Twenty Five thousand) at least in his own name, relaxable in the case of Directors representing interest holding shares of the requisite value. In case of ex officio Director the Managing Agents may themselves hold the share qualification of Rs. 25,000/-.

12. The company should also submit a copy of the Annual Statement of Accounts and a copy of the Directors speech every year.

13. The company should submit quarterly reports regarding the progress made for issuing capital.

14. A copy of this Consent Order should be published in the Memorandum and Articles of Association like a Certificate of Incorporation.

15. Articles of Association of the Company and the Agreement with the Managing Agents should be amended accordingly.

N.B.-- If action is taken in pursuance of this consent and if a company subsequently violates any condition attached to the Consent, an offence will be committed under section 13 of the said Act.

(H. U. Beg)
Controller of Capital Issues

Copy forwarded for information to:-

- (i) The Registrar/Assistant Registrar, Joint Stock Companies Karachi.....
- (ii) The State Bank of Pakistan Exchange Control Department, McLeod Road, Karachi.
- (iii) The National Investment Trust Ltd. Karachi.

"A"

REGISTERED

No. R-46-CCI (11)/71

GOVERNMENT OF PAKISTAN

MINISTRY OF FINANCE

(Office of the Controller of Capital Issues)

Islamabad, 27th April, 1970.

From

The Controller of Capital Issues.

To,

M/s. Shahtaj Sugar Mills Limited,
19, West Wharf Road,
P.O. Box No. 4766,
Karachi-2.

Dear Sirs,

With reference to the correspondence resting with your letter No. SSM.3-B/348 dated the 21st April, 1971 I am directed to say that, subject to the conditions stated hereunder and on subsequent pages hereafter, the Central Government are pleased to give their consent under the Capital Issues (Continuance of Control) Act, 1947, to the proposed issue in Pakistan by M/s. Shahtaj Sugar Mills Limited a public company registered in Karachi of capital to the value of Rs. 20,00,000/- (Rupees Twenty lacs) to be issued in the form of debentures to the Investment Corporation of Pakistan on the following terms and conditions:-

- (i) The debentures will be non-convertible.
 - (ii) The debentures will carry interest @ $3\frac{1}{2}\%$ above bank rate subject to a minimum of $9\frac{1}{2}\%$. **
 - (iii) The debentures will be issued on redeemable basis payable in half yearly instalments. The period of redemption will be 5 years and redemption will start after 2 years of grace period.
2. This amount is in addition to the capital of Rs. 2,05,00,000/- already issued by the company.
3. I am to make it quite clear that the grant of consent to this issue of capital represents no commitment of any kind on the part of the Central Government to render assistance in the matter of priorities or licences for supplies of raw materials, machinery steel, etc., of transport facilities and of other Government assistance, including the provision of foreign exchange.

Yours truly,

(H. N. AKHTAR)
Controller of Capital Issues.

CONDITIONS

1. (a) Attention is invited to the provisions of section 4 of the Capital Issues (Continuance of Control) Act, 1947, which prescribes that no security can be offered to the general public for sale nor subscription invited for any security whether through a prospectus or any other documents unless it includes a statement that the consent or recognition, as the case may be, of the Central Government has been obtained to the issue or offer of securities. The statement required to be incorporated in the prospectus or announcement or a circular or any other document must be worded as follows:-

"Consent of the Central Government has been obtained to the issue of capital under the Capital Issues (Continuance of Control) Act 1947, by an order of which a complete copy is open to public inspection at the head office of the company. It must be distinctly understood that in giving this consent the Central Government does not take any responsibility for the financial soundness of any scheme or for the correctness of any of the statements made or opinion expressed with regard to them".

It is not permissible to abbreviate this form of statement.

2. The authority conveyed in this letter will lapse on the expiry of twelve months from the date of issue of the letter. Within one month of the date when the authority so lapses, the company must forward to the Controller of Capital Issues a report of the action taken under the authority and of the amount of capital raised as a result of such action.

3. This letter must be produced at the time of the presentation of documents for registration or stamping.

4. The proceeds of the issue of capital hereby sanctioned must not without the prior permission of the Central Government in writing be used for any objects of expenditure other than those described in the application to which this order relates.

5. The company will be subject to any measures of control, licensing or acquisition that may be brought into operation either by the Central or Provincial Government.

6. Attention is drawn to the provisions of section 13 (1) (b) of the Foreign Exchange Regulation Act, 1947, which prescribes, *inter alia*, that no person shall, without the special permission of the State Bank of Pakistan, transfer any security or create (i.e. issue) or transfer any interest in a security to or in favour of a person resident outside Pakistan. A person resident outside Pakistan includes a foreign national for the time being resident in Pakistan. The company should ensure before allotting shares to non-nationals of Pakistan, or transferring shares already issued, to the names of non-nationals, that they have obtained the prior permission of the State Bank of Pakistan under the Foreign Exchange Regulation Act. The company, therefore, is required to ask all the applicants, for allotment/transfer of shares, to declare their nationality in their application and direct those who are non-national of Pakistan to produce the permission of the State Bank of Pakistan before any allotment/transfer of shares is made.

(H. N. AKHTAR)
Controller of Capital Issues.

(continued)

7. The company should submit copy of the Annual Statement of Accounts and a copy of the Directors speech every year.

8. The company should submit quarterly reports regarding the progress made for issuing capital.

9. A copy of this Consent Order should be published in the Memorandum and Articles of Association like a Certificate of Incorporation.

10. Articles of Association of the Company and the Agreement with the Managing Agents should be amended accordingly.

11. The company shall furnish to the Controller of Capital Issues the basis of the allotment of shares.

N.B.-(a) Contravention or attempt at contravention of any condition imposed by this consent order is punishable with imprisonment for a term which may extend to one year or with fine or with both under section 13 of the Capital Issues (Continuance of Control) Act, 1947.

(b) If the person committing an offence punishable under the said section is a company or other body corporate, every Director, Manager, Secretary or other Officer thereof shall, unless he proves that the offence was committed without his knowledge or that he exercised all due diligence to prevent its commission, be deemed to be guilty of such offence.

(H. N. AKHTAR)
Controller of Capital Issues.

Copy for information forwarded to:-

- (i) The Assistant Registrar, Joint Stock Companies, Karachi.
- (ii) The State Bank of Pakistan, Exchange Control Department, McLeod Road, Karachi.
- (iii) The National Investment Trust Ltd., Karachi.
- (iv) The Department of Investment Promotion and Supplies, Karachi.
- (v) The Karachi Stock Exchange Ltd., Karachi.
- (vi) The R.O. (Sec) M/Finance, Islamabad.

SPECIAL RESOLUTION

WHEREAS in pursuance of the Companies (Managing Agency & Election of Directors) Order 1972 certain amendments are necessary in the Articles of the Company;

NOW THEREFORE, It is hereby RESOLVED BY WAY OF SPECIAL RESOLUTION THAT:

1. The words 'Managing Agents' appearing in the third line of the Article 56 be and are hereby substituted by the words, 'Chief Executive'.
2. Article 93 be and is hereby amended to read as follows:
'93. The Directors shall from time to time fix the number of Directors of the Company, which in no case shall be less than Seven.'
3. One new Article 93-A be added after the Article 93 to read as follows:
'93-A. The Directors shall be elected by the members of the Company in General Meeting in the following manner:
 - (a) Each member shall have such number of votes as is equal to the product of the number of voting shares held by him and the number of Directors to be elected;
 - (b) A member may give all his votes to a single candidate or divide them between more than one of the candidates in such manner he may choose; and
 - (c) The candidate who gets the highest number of votes shall be declared elected as Director then the candidate who gets next highest number shall be so declared and so on until the total number of Directors to be elected have been so elected.'
4. Article 94 be and is hereby amended to read as follows:
'94. The qualification of Directors shall be his holding shares of the value of Rs. 25,000/- atleast in his own name, relaxable in case of a Director representing interest holding shares of the requisite value.'
5. Clauses (H) and (K) in Article 107 be and are hereby deleted.
6. Article 107-A be and is hereby added to read as follows:
'107-A A Director, including the Chief Executive, shall hold office for a period of three years unless he earlier resigns or becomes disqualified for being a Director or otherwise ceases to hold the office.'
7. Article 108 be and is hereby deleted.

8. Article 109 be and is hereby deleted.

9. The words, 'No person other than a Director retiring at the meeting shall, unless recommended by the Directors for election,' appearing in the first and second lines of the article 110 be and are hereby deleted and that the following words be and are hereby substituted in their place:

'No person other than a Director retiring on the expiry of his term of office for the period of three years.'

10. Article 111 be and is hereby deleted.

11. Article 112 be and is hereby deleted, and the following Article be and is hereby substituted in its place:

'112. The Directors shall have the powers at any time and from time to time to appoint any person to be a Director either to fill a casual vacancy or as an additional Director, and such Director shall then be proposed at the next General Meeting for election by the Shareholders.'

12. Article 115 be and is hereby deleted.

13. Article 117 be and is hereby deleted and that the following Article be and is hereby substituted in its place:

'117. The powers and functions in relation to the management and administration of the affairs of the Company shall vest in the Chief Executive may exercise all such powers and do all acts and things as may be exercised or done by the Company and are not hereby or by law expressly directed or required to be exercised or done by the Company in General Meeting, subject to the general supervision and control of the Directors and also subject to the provisions of any law and of these presents and of any regulations not being inconsistent with these presents from time to time made by the Company in General Meeting by Special Resolutions, provided that no regulations so made shall invalidate any prior act of the Chief Executive and of the other Directors which would have been valid if such regulations had not been made.'

14. Article 119 be and is hereby amended to read as follows:

'119. The Chairman of the Board of Directors (elected by the Directors) shall preside at the meeting of the Board and if at

any meeting the Chairman is not present within Fifteen (15) minutes after the time appointed for holding the same, the Directors present may choose one of their numbers to be the Chairman of the Meeting.'

15. The words, 'Managing Director' appearing in the second line of Article 128 be and are hereby substituted by the words, 'Chief Executive.'

16. The words, 'Managing Director' appearing in the second line of Article 129 be and are hereby substituted by the words, 'Chief Executive.'

17. Article 133 be and is hereby amended to read as follows:

'133. Any Director may by writing under his hand left at the office nominate any other Director or any other person to act as alternate Director in his place at any meeting at which he is not present subject to the provisions of Section 86-B of the Act concerning approval of such appointment by the Directors and at his discretion may remove such Alternate Director and on such appointment being made the Alternate Director be subject in all respects to the terms and conditions existing with reference to the other Directors whilst so acting shall exercise and discharge all the functions, powers and duties of the Director he represents, and shall be entitled to the remuneration of Directors. Any Director acting as an Alternate Director shall have an additional vote at Board Meeting for each Director for whom he acts as Alternate Director. An Alternate Director shall ipso facto cease to be an Alternate Director if his appointer ceases for any reason to be a Director otherwise than by retiring and being immediately re-elected.'

18. The words, 'Managing Director' appearing in ninth line of the Article 134 be and is hereby substituted by the words, 'Chief Executive.'

19. Article 136 be and is hereby deleted.

20. Article 137 be and is hereby deleted and the following Article be and is hereby substituted in its place:

'137. The Directors shall appoint a person to hold or continue in the office of the Chief Executive who shall not be the Chief Executive of any other Company and shall be paid such remuneration for acting as Chief Executive as will be determined by the Company in General Meeting.'

21. Article 138, 139 and 140 be and are hereby deleted.
22. Article 184 be and is hereby deleted and the following Article be and is hereby substituted in its place:

 '184. A notice may be given by the Company to any member personally or by sending it by post to him at his registered address in Pakistan'.
23. The words, 'Managing Agents' appearing in the second line of Article 195 be and is hereby substituted by the words, 'Chief Executive.'
24. Further Resolved by way of Special Resolution that all the Articles of the Company be renumbered in accordance with the change and deletion as approved above.

Dated:- 19th January 1973.

REGISTERED

A/B

No. R. 9-CCI (II)/78
Government of Pakistan
Finance Division
(Office of the Controller of Capital Issues)

Islamabad, the 22nd March, 1978

From : The Controller of Capital Issues.

To : M/s. Shahtaj Sugar Mills Limited,
19, West Wharf, P.O. Box No. 4766,
Karachi-2.

Dear Sirs,

With reference to your letter No. M : 16-E/78 dated the 9th February, 1978. I am directed to say that the Federal Government are pleased to give their consent under the Capital Issues (Continuance of Control), Act 1947 to the proposed issue in Pakistan by M/s. Shahtaj Sugar Mills Limited, a public company registered in Karachi of capital to the value of Rs. 41,00,000/- (Rupees Forty one lac only) divided into 4,10,000 fully paid ordinary shares of Rs. 10/- each to be issued at par in the form of bonus shares out of the current profits/General Reserve/15BB Reserve/Free Reserves of the company.

2. The amount is in addition to the capital of Rs. 2,05,00,000/- already issued by the company.

3. This authority conveyed in this letter will lapse on the expiry of twelve months from the date of issue of the letter. Within one month of the date when the authority so lapses, the company must forward to the Controller of Capital Issues a report of the action taken under the authority and of the amount of capital raised as a result of such action.

4. The terms and conditions imposed in this Ministry's Consent Order No. R-46-CCI (II) /71 dated the 27th April, 1971, will continue in force subject to alterations/additions/deletions, if any, prescribed overleaf.

Yours truly,

Sd:-

(Ahadullah Akmal)
Controller of Capital Issues.

Copy for information forward to:

1. The Assistant Registrar of Joint Stock Companies. Karachi.
2. The State Bank of Pakistan, Exchange Control Department, McLeod Road Karachi.
3. The Department of Investment Promotion and Supplies, Karachi.
4. The Member (Taxes,) Central Board of Revenue, Islamabad (two copies).
5. The Karachi/Lahore Stock Exchange Ltd., Karachi/Lahore.
6. The National Investment Trust Ltd., Karachi.
7. The R. O. (S).

By Order etc.,

(Fida Hussain)
Section Officer.

P.T.O.

Further Conditions

1. Henceforth distribution of dividends out of free reserves if made, should be only to such extent that the balance free reserves continue to be not less than 25% of the enhanced paid up Capital.

2. The depreciation shall be charged at not less than the rates of depreciation prescribed under Income Tax Act.

3. Bonus Shares should be issued strictly in accordance with the paid up value of shares held by existing shareholders.

4. Bonus shares should be issued within six weeks of the issue of this Consent Order.

N.B.- (a) Contravention or attempt at contravention of any condition imposed by this consent order is punishable with imprisonment for a term which may extend to one year or with fine or with both under section 13 of the Capital Issues (Continuance of Control) Act. 1947.

(b) If the person committing an offence punishable under the said section is a company or other body corporate, every Director, Manager, Secretary or other Officer thereof shall, unless he proves that the offence was committed without his knowledge or that he exercised all due diligence to prevent its commission, be deemed to be guilty of such offence.

Sd :-

(Ahadullah Akmal)
Controller of Capital Issues

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REGISTERED

No. R.47-CCI(III)/82
Government of Pakistan
Finance Division
(Office of the Controller of Capital Issues)

Islamabad the 25th November, 1982

M/s. Shahtaj Sugar Mills Limited,
83-Shahrah-e-Quaid-e-Azam,
Lahore

Dear Sirs,

With reference to the correspondence resting with your letter No. SSM: 1/82 dated 9th October, 1982. I am directed to say that, subject to the conditions states hereunder and on subsequent pages hereafter, the Federal Government are pleased to give their consent under the Capital Issues (Continuance of Control) Act, 1947 to the proposed issue in Pakistan by M/s. Shahtaj Sugar Mills Limited a public company, registered in Karachi of capital to the value of Rs. 970,880/- (Rupees Nine hundred seventy thousand eight hundred and eighty only), divided into 97,088 ordinary shares of Rs. 10/- each at a premium of Rs. 5.45 per share. The entire amount is to be issued to PICIC against conversion of its outstanding loan as per loan agreement dated 26th July, 1978.

2. This amount is in addition of the capital of Rs. 246 million already issued by the company.
3. I am to make it quite clear that the grant of consent to this issue of capital represents no commitment of any kind on the part of the Federal Government to render assistance in the matter of priorities or licences for supplies of raw materials, machinery, steels etc., or transport facilities and of other Government assistance, including the provision of foreign exchange.

Yours truly,

(Abdus Sobhan Miah)
Controller of Capital Issues

1. (a) Attention is invited to the provisions of section 4 of Capital Issues (Continuance of Control) Act, 1947, which prescribes that no security can be offered to the general public for sale nor subscription invited for any security whether through a prosecution or any other documents unless it includes a statement that the consent or recognition, as the case may be, of the Federal Government has been obtained to the issue or offer of securities. The statement required to be incorporated in the prospectus or announcement or a circular or any other document.

"Consent of the Federal Government has been obtained to the issue of capital under the Capital Issues (Continuance of Control) Act, 1947 by an order of which a complete copy is open to public inspection at the head office of the company. It must be distinctly understood that in giving this consent the Federal Government does not take any responsibility for the financial soundness of any scheme or for the correctness of any of the statement made or opinion expressed with regard to them.

It is not permissible to abbreviate this form of statement;

- (b) (i) The prospectus, announcement, circular or any other documents offering for sale any securities to the General Public or inviting subscription therefor requires prior approval of the Controller of Capital Issues failing which the company will be deemed to have contravened section 4 of the Capital Issues (Continuance of Control) Act, 1947 punishable under section 13 thereof (please see note below);
 - (b) (ii) The prospectus, announcement, circular or any other documents for sale of any securities to the general public should be submitted to the Controller of Capital Issues for approval after getting it cleared with the Karachi/Lahore Stock Exchange.
 - (c) The application for subscription shall be made only in the form at Annexure "A" and subject to the terms and conditions set out in the instructions at Annexure "B". The format of the form may be adapted for computer use without any change in the items contained therein. Both the form as well as the instructions shall be incorporated in the prospectus, announcement, circular or other document referred to in sub-clause (b) above;
 - (d) The promoters should raise their portion of the capital and invest the same in the implementation of the project before publishing a prospectus and inviting a public offer.
2. The authority conveyed in this letter will lapse on the expiry of twelve months from the date of issue of the letter. Within one month of the date when the authority so lapses, the company must forward to the Controller of Capital Issues a report of the action taken under the authority and of the amount of capital raised as result of such action.
 3. The letter must be produced at the time of the presentation of document for registration or stamping.
 4. The proceeds of the issue of capital hereby sanction must not without the prior permission of the Federal Government in writing be used for any objects of expenditure other than those described in the application to which this order relates.

5. The company will be subject to any measures of control, licensing or acquisition that may be brought into operation either by the Federal or Provincial Government.
6. Attention is drawn to the provisions of section 13(1)(b) of the Foreign Exchange Regulation Act, 1947, which prescribes, inter-alia that no person shall without the special permission of the State Bank of Pakistan, transfer any security or create (i.e. issue) or transfer any interest in a security to or in favour of a person resident outside Pakistan. A person resident outside Pakistan includes a foreign national for the time being resident in Pakistan, the company should ensure before allotting shares to non-nationals of Pakistan or transferring shares already issued to the names of non-nationals, that they have obtained the prior permission of the State Bank of Pakistan under the Foreign Exchange Regulation Act. The company, therefore is required to ask all the applicants, for allotment/transfer of shares, to declare their nationality, in their application and direct those who are non-national of Pakistan to produce the permission of the State Bank of Pakistan before any allotment/transfer of shares made.

The company must forward to the Controller of Capital Issues a report of the action taken under the authority indicating therein the following information:-

7. The terms of appointment of sole purchase, sale or distribution agent will be subject to the prior approval of the Controller of Capital Issues.
8. The remuneration and other terms and conditions of appointment of Chairman, Managing Director, or other Chief Executive, by whatever name called or the remuneration of the Director for performing extra services whether whole-time or part-time shall be subject to the provisions of Finance Division Notification SRO No. 572(I)/82 dated 16th June, 1982.
9. The remuneration of Director for attending meetings of the Board to persons other than the regularly paid Chief Executive and full time working director shall not exceed Rs. 500/- (Rupees Five hundred) per meeting. No remuneration shall be paid to the Chief Executive and other directors who work whole-time on remuneration for the company.
10. The quorum of Directors meeting shall consist of at least three Directors present in person. If all the Directors except one are disqualified from voting, the matter should be decided in the General Meeting.
11. The quorum of General Meeting shall consist of at least five persons present in person or by proxy.
12. The qualification of a director shall be his holding shares to the value of Rs. 5000/- (Rupees five thousand only) at least in his own name,

relaxable in the case of directors representing interest holding shares of the requisite value.

13. Depreciation shall be charged at a rate not less than the rate of depreciation as admissible under Income Tax Law.
14. The company should submit a copy of the Annual Statement of Accounts and a copy of Directors speech every year.
15. The company should submit:-
 - (a) A quarterly report regarding the progress made for issuing capital;
 - (b) A report within ten days from the date of closure of subscription about the number and value of shares applied for by the general public.
16. A copy of this consent order should be published in the Memorandum and Articles of Association like a Certificate of Incorporation.
17. Articles of Association of the Company should be amended accordingly.
18. The company shall furnish to the Controller of Capital Issues the basis of the allotment of shares.

N.B. (a) CONTRAVENTION OR ATTEMPT AT CONTRAVENTION OF ANY CONDITION IMPOSED BY THE CONSENT ORDER IS PUNISHABLE WITH IMPRISONMENT FOR A TERM WHICH MAY EXTEND TO ONE YEAR OR WITH FINE OR WITH BOTH UNDER SECTION 13 OF THE CAPITAL ISSUES (CONTINUANCE OF CONTROL) ACT, 1947.

- (b) If the person committing an offence punishable under the said section is a company or other body corporate, every Director, Manager, Secretary or other Officer thereof shall, unless he proves that the offence was committed without his knowledge or that he exercised all due diligence to prevent its commission, be deemed to be guilty of such offence.

(Abdus Sobhan Miah)
Controller of Capital Issues

Copy for information forwarded to:-

1. The Assistant Registrar, Joint Stock Companies, Karachi.
2. The State Bank of Pakistan, E.C. Department, Karachi.
3. The National Investment Trust Limited, Karachi.
4. The Investment Promotion Bureau, Karachi.
5. The Karachi/Lahore Stock Exchange Ltd., Karachi/Lahore.
6. The Investment Corporation of Pakistan, Karachi.
7. The Central Board of Revenue, Islamabad.

By order etc.,

(Ajaz Muhiuddin)
Section Officer

No. R-47-CCI(III)/82
Government of Pakistan
Finance Division

(OFFICE OF THE CONTROLLER OF CAPITAL ISSUES)

To Islamabad, the 27th March, 1983

M/s. Shahtaj Sugar Mills Ltd.,
83, Shahrah-e-Quaid-e-Azam,
Lahore

Subject:- ISSUE OF CAPITAL -- SHAHTAJ SUGAR MILLS LIMITED

Dear Sirs,

With reference to the correspondence resting with your letter No. SSM:DA: 21 (a) dated 12th March, 1983 on the subject noted above, I am directed to say that the Federal Government is pleased to substitute the figure and the words "Rs. 970,880.....at a premium of Rs. 5.45 per share" appearing in lines 8 to 10 of para of this office Consent Order of even number dated 25th November, 1982 by the following:-

"Rs. 1.5 million (Rupees One Million Five Hundred Thousand only) divided into 0.15 million ordinary shares of Rs. 10/- each at a premium of Rs. 5.35 per share".

Yours truly,

(Abdus Sobhan Miah)
CONTROLLER OF CAPITAL
ISSUES

(b) SPECIAL BUSINESS

1. To consider and, if thought fit, to pass, with or without modification, the following Resolution as a "Special Resolution".

"That the existing Articles of Association of the Company be altered to bring them in conformity with the provisions of the Companies Ordinance, 1984; and that the Revised Articles of Association of the Company be adopted as Articles of Association of the Company in substitution for and to the exclusion of all existing Articles of Association thereof".

27th February, 1986.

SPECIAL BUSINESS

The following resolution was unanimously adopted as an Extraordinary Resolution on 30.3.83:

1. That in pursuance of Article 175 of the Company's Articles of Association a sum of Rs. 24,60,000 forming a part of the undistributed profits of the Company be capitalized and that such sum be applied on behalf of the persons whose names appear on the Register of Members on the date to be specified by the Directors in payment in full of 2,46,000 ordinary shares of Rs. 10/- each in the Company and that the Directors be and are hereby authorized to allot such shares credited as fully paid up to the said members in the proportion of one new share for every ten shares registered in their names on the date to be specified by the Directors.

That in the event of any Member holding less than ten shares or a number of shares which is not a multiple of ten, a fraction of one tenth of a new share be allotted to him for each such existing share and the Directors be and they are hereby authorized and instructed to consolidate all such fraction and to sell shares constituted thereby and to distribute the sale proceeds amongst the allottees of such fractions according to their entitlement.

That the Directors be and are hereby authorized to settle any question or difficulty whatsoever in respect of the aforesaid 2,46,000 Ordinary Shares (including any question or difficulty which may arise in connection with any deceased or insolvent shareholder or any shareholder suffering from any disability), as they may deem fit.

That the Directors of the Company be and are hereby authorized to allot 1,50,000 Ordinary Shares of Rs. 10/- each of the Company at a premium of Rs. 5.34 per share to M/s. Pakistan Industrial Credit & Investment Corporation Limited (PICIC) in exercise of their option under the Loan Agreement.

That the Shareholders of the Company hereby waive their right to allotment of aforesaid shares in their names, as the Company is bound by terms of the Loan Agreement with PICIC to allot these shares to Pakistan Industrial Credit & Investment Corporation Limited.

That the Ordinary shares being issued under this resolution will rank *pari passu* with the existing capital of the Company subject to the Memorandum and Articles of Association of the Company, but will not participate in the dividend declared for the year ended 30th September, 1982.

2. It was resolved to amend Article No. 98 of the Company's Articles of Association and the following resolution was unanimously adopted as a Special Resolution:

"That in pursuance of Controller of Capital Issues Notification No. S.R.O. 571(1)/82 dated 14th June, 1982, Article 98 of the Articles of Association of the Company be and is hereby altered and re-constituted as follows:-

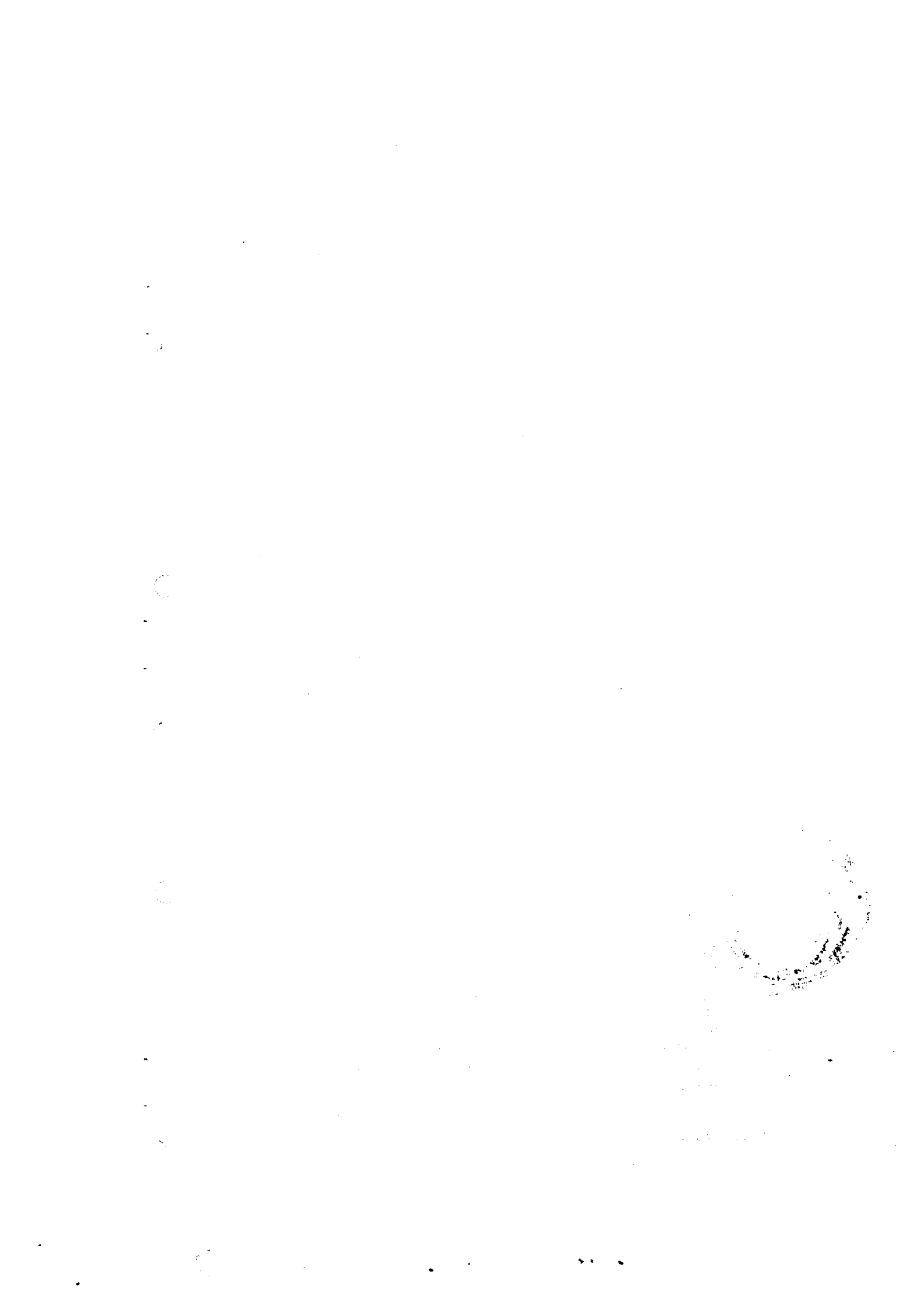
"98. The Remuneration of the Directors shall from time to time be determined by the Company in General Meeting subject to any approval required by law. The Remuneration paid for attending meeting of the Board of persons other than the regularly paid Chief Executive and full time Working Directors shall not exceed five hundred rupees per meeting."

SPECIAL RESOLUTION

The following resolution was unanimously adopted as an extra-ordinary resolution : —

"That the existing Articles of Association of the Company be altered to bring them in conformity with the provisions of the Companies Ordinance, 1984 and that the Revised Articles of Association of the Company be adopted as Articles of Association of the Company in substitution for and to the exclusion of all existing Articles of Association thereof".

30th March, 1986:



THE COMPANIES ORDINANCE 1984


COMPANY LIMITED BY SHARES

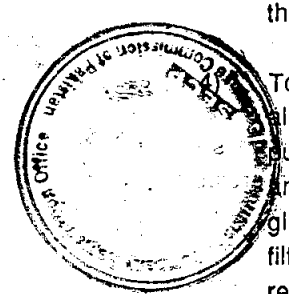
Memorandum of Association
OF
Shahtaj Sugar Mills Limited



- I. The name of the Company is "SHAHTAJ SUGAR MILLS LIMITED".
- II. The Registered Office of the Company shall be situated in Province of West Pakistan.
- III. The objects for which the Company is established are:-
 - 1) To carry on in Pakistan or in any part of the world all or any of the business of Sugar manufacturers and dealers in all their respective branches and in particular without prejudice to the generality of the foregoing words to carry on the business of manufacturing, producing, refining, procuring, preparing, importing, exporting, exchanging, buying, selling, acquiring distributing and dealing in sugar of any variety or varieties, gur, molasses, sugar-candy, jaggery, sugar-cane, sugar-beet and any other vegetable, fruit or corn or any other material from which sugar and allied products could be manufactured, and all products thereof including confectionery, tinned, canned, bottled and preserved fruits and vegetables, syrups, glucose, essences and food products generally and/or by-products thereof, of all kinds, including ethyl, alcohol, acetone, carbon dioxide, hydrogen, potash, cane-wax, fertilizers, and food products generally (provided always that the alcohol and spirit shall only be manufactured for industrial consumption and not for human consumption) and in connection therewith to own, acquire, construct, erect, operate plant or plants with all the machinery, equipment, refineries, buildings, mills and other works and supporting facilities necessary or incidental to the above objects or any of them.
 - 2) To grow, plant, cultivate or otherwise acquire sugar-cane, sugar-beet, fruits, vegetables and corns of any variety or varieties on Company's own lands or on lands of others, on such terms and conditions as the Company may deem fit from

time to time and advance moneys and loans to growers, farmers, landowners and contractors and provide them with seeds, manure, tools, machinery and or other facilities, on such terms and conditions as the Company may deem fit and to consume all or any such grown, owned or acquired sugar-cane, sugar-beet, fruit, vegetable or corn, in Company's own undertakings or to dispose of supply, export or sell all or any of these commodities to any dealers, distributors, manufacturers, exporters and others on such terms and conditions as the Company may deem proper.

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- 3) To carry on the business in all its branches, in Pakistan or in any part of the world, as brokers, commission agents, buyers, sellers and dealers of sugar of any variety or varieties, sugar-beet, fruit, vegetable, corn or any produce or form of such commodities or of advancing of money by way of loan upon the security in respect of the same or upon or against bills of lading, dock warrants or other documents of title representing the same.

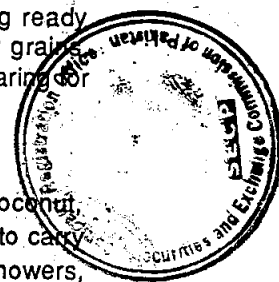


To carry on the business of manufacturers of and dealers in all kinds and classes of pulp including sugar-cane, bagasse pulp, sulphite wood pulp, mechanical pulp, and soda pulp and paper of all kinds, including transparent, writing, printing, glazed, absorbent, news-printing, wrapping, tissue, blotting, filter, bank and bond, brown, buff or coloured, clothlined, azulaid, cream-laid, grease or waterproof, hand-made parchment, drawing, kraft, carbon, envelope cardboard, box board, veneer board, straw board, mill board, duplex and triplex boards, wall and ceiling papers and all kinds of articles in the manufacture of which pulp, paper or board is used and materials used in the manufacture or treatment of pulp and paper.

- 5) To carry on the business of manufacturers of and dealers in chemical products of any nature and kind whatsoever and as wholesale and retail chemists and druggists, analytical chemists, drysalts, oil and colour men, importers, exporters and manufacturers of and dealers in heavy chemicals, alkalis, acids, drugs, tannins, essences, pharmaceutical, photographic sizing, medicinal, chemical, industrial and other proportions and articles of any nature and kind whatsoever, mineral and other waters, cements, oils paints, pigments and varnishes, compounds, drugs, dyestuffs, organic or mineral intermediates, paint and colour grinders, makers of and dealers in proprietary articles of all kinds, and of electrical, chemical, photographic, surgical and scientific apparatus and materials.
- 6) To acquire by purchase, lease or otherwise, ranches and

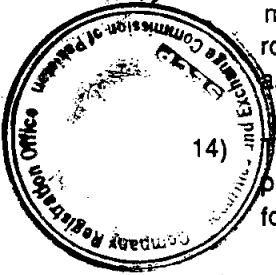
sheep farms, poultry farms and to carry on the trades or businesses of cattle rearers, sheep farmers and poultry farmers, and to export, import, procure, manufacture, produce, acquire, buy, sell, distribute and deal in meat, live cattle and sheep, poultry, eggs, hides and skins, fat, tallow, grease, offal and other animal products.

- 7) To carry on all or any of the businesses of farmers, dairymen, milk contractors, dairy farmers, millers, purveyors and vendors of milk, cream, cheese, butter, poultry and provisions of all kinds, growers of and dealers in corn, hay and straw, seedmen and nurserymen, and to buy, sell and trade in any goods usually traded in any of the above businesses, or any other business associated with the farming interest which may be advantageously carried on by the Company.
- 8) To carry on the business of milling all kinds of grains by taking on the lease or in exchange, hiring, purchasing, erecting, getting allotted or otherwise acquiring rice mills, husking mills, grinding mills etc., and for that purpose buying ready and forward paddy, wheat, maize, barley, and other grains, advancing money on crop of grains, making and preparing for market grains and by-products of grains in any form.
- 9) To cultivate fruits, vegetables, tea, coffee, rubber, coconut, timber, tobacco, spices and other produce of the soil, to carry on and work the business of planters, cultivators, winnowers, buyers and sellers of every kind of fruits, vegetables, minerals or other produce of the soil, to grow, prepare, manufacture and render marketable any such produce, and to buy, sell, export, import, dispose of and deal in any such produce, either in its prepared, manufactured or raw state and either by wholesale or retail and to purchase, take on lease or otherwise, acquire, hold and work any lands or plantations suitable for any of such purposes and any concessions, rights, powers and privileges relating thereto.
- 10) To carry on business as timber merchants, saw mill proprietors, and timber growers and to buy, sell, grow, prepare for market, export, and deal in timber and food of all kinds, to buy, sell, clear, plant and work timber estates and to manufacture, sell, buy and deal in articles of all kinds in the manufacture of which timber or wood is used.
- 11) To purchase, take in exchange or otherwise acquire either absolutely or by lease, licence, concession, grant or otherwise from persons or Government, any lands, mines, quarries, mineral rights, easements, rights and privileges and to



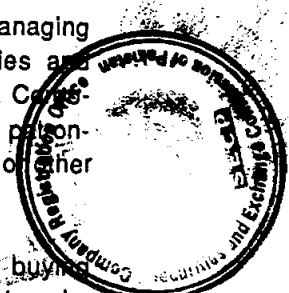
search for ores, minerals and mines and to grant licences for mining in or on any lands which may be acquired by the Company and to lease out any such lands for building or agricultural use and to sell or otherwise dispose of the land, mines, quarries and other property of the Company.

- 12) To own, prospect for, explore, acquire by lease, licence, purchase or otherwise, open, work, develop and maintain natural deposits of salt, brine, natron, soda, nitrate and other chemical substances of all kinds, clay and sand pits, slabs, stone, chalk and limestone quarries, coal mines, copper mines, mineral oil fields and mines of all kinds and to sell or otherwise dispose of any of the above products, to manufacture, prepare, treat quarriable and mineral substances or products of all kinds obtained as aforesaid for sale or use or for manufacturing, building or any other purpose and to manufacture therefrom any kind of products and to expend such sums of money as may be deemed requisite and advisable in exploration, survey and development for any of the above purposes.
- 13) To carry on the business of manufacturing, procuring, importing, exporting, buying, selling, distributing and dealing in packages and containers made of wood, paper, card-board, jute, tin or of any other suitable metals or materials and to manufacture, import, export, procure, purchase, sell, hire, borrow and lend or otherwise to deal in machinery, apparatus and accessories appertaining to and in connection therewith.
- 14) To carry on the business of cold storage, manufacture of ice, preservation of fruits, vegetables, fish, meat, medicines and food products of all kinds and like commodities.
- 15) To provide fullest possible openings, for the employment of Pakistan Nationals in the administrative and technical departments of the Company; to accept such of them for, and to provide them with necessary training in Pakistan and abroad, as the Company may be able to take into its service; and to establish, provide, subsidise, finance, maintain, and conduct schools, training centres, laboratories, workshops, and research and other institutions, for their education, instruction and training and to give them scholarships, stipends and other monetary help for the purpose.
- 16) To purchase, take on lease or in exchange, hire or otherwise acquire and hold for any estate or interest any lands, buildings, easements, rights, privileges, concessions, patents, patent rights, licences, secret processes, machinery, plant, stock-in-trade, and any real or personal property of any kind neces-



sary or convenient for the purposes of or in connection with the Company's business or any branch or department thereof.

- 17) To purchase, erect construct, work, equip, maintain, improve or alter, or assist in the purchase, erection, construction, working, equipment, maintenance, improvement or alteration of any mills, factories, works, plant, machinery, scrapers, cutters, crushers, pressers, and engines, buildings, offices, warehouses, dwelling houses, labour lines, places of worship, schools, hospitals, dispensaries, canteens, shops, clubs, recreation rooms and grounds, gardens, farms, water courses, tanks, wells, reservoirs, aqueducts, canals, telegraphs, roads, railways, tramways, sidings, bridges, skidpiers, slips, gridirons, lorries, cars, wagons, carts, and other works and conveniences which the Company may think directly or indirectly conducive to any of its objects.
- 18) To obtain and or hold the office of and act as Managing Agents, Managers, brokers, contractors, secretaries and treasurers of any trading or manufacturing company, Corporation, Board, Committee, or concern whether owned, patronised or controlled by any Government, local authority or other person or persons.
- 19) To carry on business as agents, selling agents, buying agents, managers, brokers, commission agents, indentors, indenting agents, canvassers, advertisers, stockists, dealers in merchandise and commodities of all descriptions and distributors for any persons firms and companies (including without prejudice to the said generality and in particular for importers, exporters, buyers, sellers, manufacturers, merchants, concessionaries, trademen, insurers, financiers, builders, property owners and others) and generally to undertake and carry out agencies and agency work of any kind whatsoever and transact all manner of agency, booking, commission, canvassing, distributing and advertising business.
- 20) To carry on the business of importing, exporting, purchasing, selling, stocking, supplying, demonstrating, maintaining, hiring, manufacturing and distributing machinery, apparatus, accessories and materials in connection with any of the undertaking of the Company.
- 21) To establish, provide, maintain and conduct, or otherwise subsidise research laboratories and experimental workshops for scientific and technical research and experiments and undertaking and carry on all scientific and technical researches, experiments, and tests of all kinds to promote studies and re-



search both scientific and technical investigation and invention by providing, subsidising or assisting laboratories, workshops, libraries, lectures, meetings and conferences and by providing the remuneration of scientific or technical teachers and by providing for the award of scholarships, prizes, grants and bursaries to students or independent students or otherwise and generally to encourage, promote and reward studies, researches, investigations, experiments, tests and inventions of any kind that may be considered likely to assist any of the businesses which the Company is authorised to carry on.

- 22) To establish, organize, conduct and carry on either alone or in partnership with others, the business of mechanical, electrical, civil, and general engineers, mechanics, fitters, millwrights, founders and generally to act as consulting, planning, research, executive and technical engineers and advisers to all kinds of industrial and commercial undertakings.

- 23) To purchase, build, charter, affreight, hire and let out for hire, or for chartering and affreightment, and otherwise to obtain the possession of, and use, operate and dispose of, and employ or turn to account ships, lighters, barges, tugs, launches, boats and vessels of all kinds (including tank vessels), automobiles, lorries, motor trucks and tractors, aeroplanes, locomotives, wagons, tank cars, and other rolling stock, and otherwise to provide for and employ the same in the transport of Sugar, Sugar-cane, Sugar-beet, Gur, Molasses, fruit, vegetable, corn, and movable property and merchandise of all kinds, and the transportation of personnel, employees, customers, and visitors, and to purchase or otherwise to acquire any shares or interests in any ships or vessels, aeroplanes, railways, motor transportation or in any companies, possessed of or interested in any ships, vessels, aeroplanes, railways and motor transportation.

To apply for, obtain, own, register, renew, purchase, lease or otherwise to acquire, and to use, own, produce, manufacture, operate and introduce, and to sell, assign, grant, licence or otherwise dispose of patents, brevets d'invention, inventions, improvements, formulae and processes used in connection with or secured under letter patents of any government or country in the world, including licences, concessions and the like, conferring exclusive or non exclusive or limited right to use any secret or other information as to any invention which may seem capable of being used for any of the purposes of the Company or the acquisition of which may seem directly or indirectly calculated to benefit the Company, and to use, exercise, develop, disclaim, alter or modify, grant licences in re-

spect of, or otherwise turn to account the property, rights, and information so acquired, also to acquire, use, register, assign and dispose of trade marks, trade names, registered or other designs, rights of copyright, or other rights or privileges in relation to any business carried on by the Company.

- 25) To borrow or raise or secure the payment of money in such manner as the Company shall think fit and in particular by mortgage or by the issue of any shares, stocks, bonds, debentures, obligations or any other securities charged or based upon the undertaking of the Company, uncalled capital of the Company or any part of its property both present and future including the rights of the Company or without any such security and upon such terms as to priority or otherwise and generally to borrow money in such manner as the Company shall think fit.
- 26) To mortgage and charge the undertaking and all or any of the real and personal property and assets, present or future, and all or any of the uncalled capital for the time being of the Company, and to issue at par or at a premium or discount and for such consideration and with and subject to such rights, powers, privileges and conditions as may be thought fit, debentures or debenture stock either permanent or redeemable or repayable or convertible into shares and collaterally or further to secure any securities of the Company by a trust deed or other assurance.
- 27) To issue and deposit any securities which the Company has power to issue, by way of mortgage or otherwise to secure any sum less than the normal amount of such securities, and also by way of security for the performance of any contract or obligation of the Company or of its customers or other persons or corporations having dealings with the Company or in whose businesses or undertakings the Company is interested, whether directly or indirectly.
- 28) To receive money on deposit or loan from members, staff or customers of the Company or others upon such terms as the Company may approve and to give guarantees and indemnities of any description.
- 29) To lend money to any company, association, firm or person, and guarantee or undertake the performance of the obligations of any company, association, firm or person and the payment of dividends and interest on, and the repayment or payment, of capital or other moneys payable in respect of any stock, shares, debentures, debenture stock, securities and

obligations of whatsoever nature of any company, association, firm or person in any case in which such loan, undertaking or guarantee may be considered likely, directly or indirectly, to further the objects of this Company or the interests of its members.

- 30) To pay all costs, charges and expenses incurred or sustained in or about the promotion and establishment of the Company and the issue of its capital or which the Company shall consider to be in the nature of preliminary expenses including therein the cost of advertising, commissions for under-writing, brokerage, printing and stationery and expenses attendant upon the formation of agencies and local boards and to remunerate or make donations to (by cash or other assets or by the allotment of fully or partly paid shares or by a call or option on shares, debentures, debenture stock or securities of this or any other company, or in any manner, whether out of the Company's capital or profits or otherwise) any person, firm or company for service rendered in introducing any property or business to the Company or in placing or assisting to place or guaranteeing the subscription of any shares, debentures, debenture stock or other securities of the Company or for any other reason which the Company may think proper.

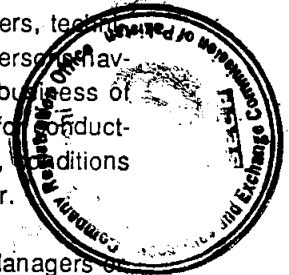
- 31) To grant pensions, allowances, gratuities and bonuses to officers, ex-officers, employees or ex-employees of the Company or its predecessors in business or the dependents or connections of such persons, to establish and maintain or concur in establishing and maintaining trusts, funds or schemes (whether contributory or non-contributory) with a view to providing pensions or other benefits for any such persons as aforesaid, their dependents or connections, and to support or subscribe to any charitable funds or institutions, the support of which may, in the opinion of the Directors, be calculated directly or indirectly to benefit the Company or its employees and to institute and maintain any club or other establishment or profit-sharing scheme calculated to advance the interests of the Company or its officers or employees.

- 32) To draw, accept, make, endorse, negotiate, discount, execute, issue, and assign cheques, promissory notes, bills of exchange, railway receipts, bills of lading, warrants, debentures, drafts, hundies and all other negotiable or transferable instruments.

- 33) To invest and deal with the moneys of the Company not immediately required for the purposes of its business in or upon such investments or securities and in such manner as may

from time to time be determined.

- 34) To undertake and execute any trust or trusts which the Company may deem to be desirable, expedient or necessary.
- 35) To institute, conduct, defend, compound or abandon any legal proceedings by or against the Company or its officers or otherwise concerning the affairs of the Company and also to compound and allow time for payment or satisfaction of any debt due and of any claims or demands by or against the Company.
- 36) To remunerate the Directors, officials, servants of the Company and others out of or in proportion to the returns or profits of the Company or otherwise as the Company may think proper.
- 37) To refer any claims or demands by or against the Company to arbitration and perform the awards.
- 38) To enter into agreement with and/or employ workers, technicians, specialists, experts, consultants and other persons having special knowledge of matters relating to the business of the Company, as may be necessary or expedient for conducting the business of the Company, on such terms, conditions and stipulations as the Company may deem proper.
- 39) To depute any of the representatives, Directors, Managers or other employees of the Company to any part of Pakistan or abroad for any of the purposes which may be expected to benefit the Company, directly or indirectly, with such staff as necessary, and incur such expenses of journey or voyage, lodging, boarding, and other expenses as may be necessary for these purposes and to make payment or to give remuneration to such person or persons through whose agency, assistance or mediation or efforts necessary facilities and help are made available to the Company towards one or more objects of the Company.
- 40) To adopt such means of making known or giving publicity to the business of the Company as may seem proper or expedient by advertisement in the press, by outdoor publicity, by showcards, calendars, pamphlets, folders, circulars, posters, or by publication of books, booklets, periodicals, magazines or by other suitable media of publicity and to grant prizes rewards and donations which may be expected to make the Company popular and prosperous.
- 41) To pay for any property or rights acquired by the Company, ei-



ther in cash or fully or partly paid-up shares, with or without preferred or deferred or guaranteed rights in respect of dividend or repayment of capital or otherwise, or by any securities which the Company has power to issue, or partly in one mode and partly in another, and generally on such terms as the Company may determine.

- 42) To accept payment for any property or rights sold, or otherwise disposed of or dealt with by the Company, either in cash, by instalments or otherwise, or in fully or partly paid-up shares of any company or corporation, with or without deferred or preferred or guaranteed rights in respect of dividend or repayment of capital or otherwise, or in debentures or mortgage, debentures or debenture stock, mortgages, or other securities of any company or corporation, or partly in one mode and partly in another, and generally on such terms as the Company may determine, and to hold, dispose of or otherwise deal with any shares, stock or securities so acquired.

- 43) To obtain from any Government, State, Municipal or other public authorities, supreme or otherwise, rights, concessions, licences, permits and the like, periodical or otherwise, for conduct of any of the objects for which the Company is established.

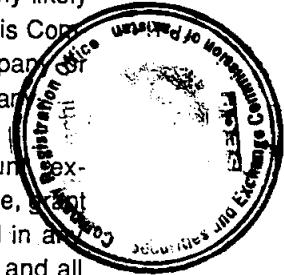
- 44) To issue any shares or securities which the Company has power to issue by way of security or indemnity to any person whom the Company has agreed or is bound to indemnify against any debt, liability, costs, losses or expenses out of the funds of the Company.

- 45) To purchase or otherwise acquire and undertake the whole or any part of business, property, rights, and liabilities of any person, firm, or company, carrying on any business, which this Company is authorised to carry on or possessing property or rights and privileges suitable for any of the objects of this company and to purchase, acquire, sell and deal in property, shares, stocks, debentures, debenture-stock of any such person firm or company and to conduct, make or carry into effect any arrangements in regard to the winding up of business of any such person, firm or company.

- 46) To enter into partnership or any joint venture, arrangement or any arrangements for sharing profits, union of interest or co-operation with any company, firm or person, and to acquire and hold, sell, deal with or dispose of shares stock or securities of any such company, and to guarantee the contracts or liabilities of, or the payment of the dividends, interest or capi-

tal of any shares, stock or securities of and to subsidise or otherwise assist any such company.

- 47) To insure against losses, damages, risks, accidents and liabilities of all kinds which may effect the Company, whether in respect of its contracts, agreements, advances or securities or in respect of servants or employees of the Company, or in respect of property belonging to or leased to or hired by the Company, either by setting apart funds of the Company or by effecting such insurances, and in the latter case to pay the premium thereon.
- 48) To promote and form any company or companies for the purpose of acquiring all or any of the property, rights and liabilities of this Company.
- 49) To promote, form and to be interested in and to acquire or take by subscription, purchase or otherwise whatsoever and to hold shares or stocks in, or securities of any company, association or undertaking in Pakistan or abroad having any objects of like nature or description with any of those of this Company or such as may be deemed by this Company likely to advance either directly or indirectly the interest of this Company or to subsidise or otherwise assist such company or companies if it directly or indirectly benefits this Company.
- 50) To sell, improve, manage, develop, turn to account, exchange, let on rent, royalty, share of profits or otherwise, grant licences, easements and other rights in or over, and in any other manner deal with or dispose of the undertaking and all or any of the property or assets for the time being of the Company for such consideration as the Company may think fit.
- 51) To amalgamate with any other company whose objects are or include objects similar to those of this Company, whether by sale or purchase (for fully or partly paid-up shares or otherwise) of the undertaking, subject to the liabilities of this or any such other company as aforesaid, with or without winding up or by sale or purchase (for fully or partly paid-up shares or otherwise) of all or a controlling interest in the shares or stock of this or any such other company as aforesaid, or by partnership, or any arrangement of the nature of partnership, or in any other manner.
- 52) To purchase, acquire, own, underwrite or guarantee the subscription of shares, stocks, debentures, debenture stocks, bonds, obligations and securities issued or guaranteed by any company, association, Trust, undertaking or body consti-



tuted and carrying on business in Pakistan (or elsewhere as may be allowed by law) or issued or guaranteed by any Government, State, Municipality or any other Public Body or Authority in Pakistan (or elsewhere as may be allowed by law) at such times and upon such terms conditions as to remuneration as may be agreed upon and to sell, exchange, transfer, dispose of, deal in and turn to account such shares, stocks, debentures, debenture stocks, bonds, obligations and securities.

53) To sell or dispose of or transfer the business, property or undertaking of the Company or part or parts thereof for such consideration as the Company may think fit and in particular for shares, debentures or securities of any other company having objects altogether or in part similar to those of this Company.

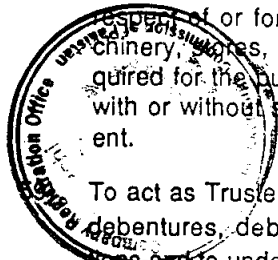
54) To procure the Company to be registered or recognised in any foreign country or any place.

55) To enter into contracts giving any persons or company the sole exclusive right to supply the Company with any articles or commodities used or sold by the Company, on such terms and conditions and for such period as may be determined from time to time.

56) To create provident fund, reserve fund, sinking fund, insurance fund, or any other special fund conducive to the interest of the Company.

57) To lend money to members of staff or customers of the Company or others having dealings with the Company with or without security and on such terms as the Company may deem expedient.

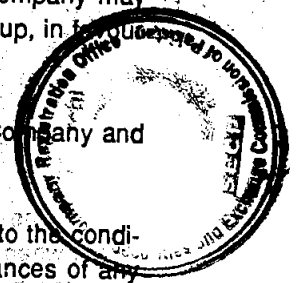
58) To make advances of such sum or sums of money upon or in respect of or for the purchase of raw materials, goods, machinery, or any other property, articles and things, required for the purpose of the Company upon such terms and with or without security, as the Company may deem expedient.



To act as Trustees of any deeds constituting or securing any debentures, debenture stock, or other securities or obligations and to undertake and execute any other trust and also to undertake the office of executor, administrator, treasurer or registrar or to become manager or secretary of any business and to keep for any company, Government authority or body, any register relating to any stocks, funds, shares, or securities

or to undertake any duties in relation to the registration of transfers, the issue of certificates or the registration of transfers, the issue of certificates or otherwise.

- 60) To invest and deal with moneys of the Company not immediately required, upon such securities and in such manner as may from time to time be determined.
- 61) To borrow or raise or secure the payment of money in such manner and on such terms as the Company shall think fit, and in particular by the issue of mortgage debentures, debentures or debenture stock or other securities, perpetual or otherwise, charged, or not charged upon all or any of the Company's assets (both present and future) including its uncalled capital, and either with or without participation in profits or voting powers, and to redeem or pay off any such securities, and to insure the repayment of any moneys so borrowed in such manner and on such terms as may seem expedient.
- 62) To accept stock, shares, debentures, mortgage debentures or other security of any other company in payment or part payment for any services rendered or for any sale made to or debt owing from any such company.
- 63) To capitalise such portion of the profits of the Company as are not distributed among shareholders of the Company in the form of dividends and as the Directors of the Company may think fit and to issue bonus shares, as fully paid up, in favour of the shareholders of the Company.
- 64) To appoint legal and technical advisers for the Company and to pay the necessary expenses for the same.
- 65) To employ experts to investigate and examine into the conditions, prospects, value, character, and circumstances of any business, concerns and undertakings and generally of any assets, property or rights.
- 66) To Issue any shares of the Company as full or in part paid up, and at par or at a premium.
- 67) To aid pecuniarily or otherwise any association, body or movement having for its object the solution, settlement or surmounting industrial or labour problems or troubles or the promotion of industry or trade or development of savings and investment thereof.
- 68) To distribute as dividend or bonus among the members or to



place to reserve or otherwise to apply as the Company may from time to time think fit any moneys received by way of premium on shares or debentures issued at a premium by the Company and any money received in respect of dividend accrued on forfeited shares and moneys arising from the sale by the Company of forfeited shares or from unclaimed dividends.

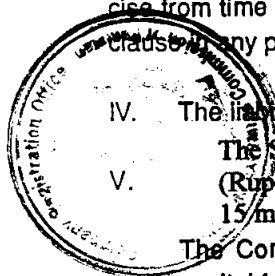
- 69) To distribute among members of the Company in specie or otherwise any assets of the Company or any proceeds of sale or disposal of any assets of the Company, including the share, debentures or other securities of any other company formed to take over the whole or any part of the assets and liabilities of this Company, but so that no distribution amounting to a reduction of capital be made except with the sanction (if any) for the time being required by law.
- 70) To do all or any of the above things in Pakistan or in any part of the world, and either as principals, agents, trustees, contractors or others, and either alone or in conjunction with others, and either by or through agents, sub-contractors, trustees or otherwise.
- 71) To carry on any other business which, in the opinion of the Company, is capable of being conveniently and advantageously carried on by the Company in connection with or as ancillary to the objects specified above or is calculated directly or indirectly to enhance the value of or render profitable any of the Company's property or rights.
- 72) And generally to do and to perform all such other things and acts as may appear to be incidental or conducive to the attainment of the above objects or any of them.

The objects set forth in any sub-clause of this clause shall not, except when the context expressly so requires, be in anywise limited or restricted by reference to or inference from the terms of any other sub-clause or by the name of the Company. None of such sub-clauses or the objects therein specified or powers thereby conferred shall be deemed subsidiary or auxiliary and the Company shall have full powers to exercise from time to time all or any of the powers conferred by any part of this clause in any part or parts of the world.

IV. The liability of the Members is limited.

The Share Capital of the Company is Rs.150 million
(Rupees one hundred fifty million) divided into
15 million ordinary shares of Rs.10/- each.

The Company shall have power to increase or reduce the share capital from time to time as it may think proper and the shares form-



ing the capital - original increased or reduced - may be divided into such classes, and may be issued with any preferential, deferred, qualified or special rights, privileges and conditions or with such qualifications as regards preference dividend return of capital, voting, or other special incidents and be held on such terms as may be attached thereto or as may be provided by the Company's Articles of Association for the time being, but so that where shares are issued with any preferential or special rights attached thereto such rights shall not be alterable otherwise then pursuant to the provisions of the Company's Articles of Association for the time being.



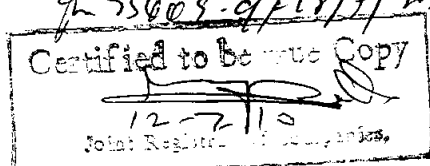
WE, the several persons, whose names and addresses are subscribed below, are desirous of being formed into a company in pursuance of this Memorandum of Association, and we respectively agree to take the number of shares in the Capital of the Company set opposite our respective names.

Names, addresses and descriptions of Subscribers.	Number of shares taken by each Subscriber.
(RASHEED A. AKHUND) Finlay House, McLeod Road, Karachi. Advocate	ONE
(MUHAMMAD UBAIDUR RAHMAN) Finlay House, McLeod Road, Karachi. Advocate	ONE
(AFTAB AHMED KHAN) Finlay House, McLeod Road, Karachi. Advocate	ONE
(NIZAM AHMED) Finlay House, McLeod Road, Karachi Advocate	ONE
(ISMAIL TEJANI) Finlay House, McLeod Road, Karachi Advocate	ONE
(EHSAN NOMANI) Finlay House, McLeod Road, Karachi Advocate	ONE
(HASAN MAHMOOD) Finlay House, McLeod Road, Karachi Advocate	ONE

DATED the day of 196

WITNESS to the above Signatures :-

(ANVER SALIM)
Finlay House,
McLeod Road, Karachi.
Lawyer



THE COMPANIES ORDINANCE, 1984

COMPANY LIMITED BY SHARES

Articles of Association

OF

Shahtaj Sugar Mills Limited

PRELIMINARY

1. The regulations in Table A in the First Schedule to the Companies Ordinance, 1984 shall not apply to the Company, except in so far as the same are repeated or contained in these Articles.

2. In these Articles, if not inconsistent with the subject or context, the words standing in the first column of the table next hereinafter contained shall bear the meanings set opposite to them respectively in the second column thereof.

WORDS

MEANING

"The Ordinance" The Companies Ordinance, 1984 including any statutory modification for the time being in force and every Act for the time being in force in Pakistan concerning joint stock companies with limited liability which may apply to the Company.

"The Company" SHAHTAJ SUGAR MILLS LIMITED.

"The Articles" These Articles of Association as originally framed or as from time to time altered by Special Resolution.

"The Company's Office" The Registered Office of the Company.

"The Registrar" The Registrar of Joint Stock Companies, Karachi.

"Month" A calendar month.



"Year"	A calendar year.
"Proxy"	A proxy appointed under these Articles or an Attorney duly constituted under a Power of Attorney.
"Person"	Any person or corporation.
"Seal"	The Common Seal of the Company.
"Directors"	The Directors for the time being of the Company.
"Chairman"	The Chairman of the Company for the time being.
"The Secretary"	The Secretary of the Company for the time being and the expression "Secretary" shall include a temporary or Assistant Secretary and any person appointed by the Directors to perform any of the duties of the Secretary.
"Original Capital"	The Capital specified in the Memorandum of Association of the Company.
"Executors"	include administrators.
"Dividend"	include Bonus.
"Debenture and Debenture holder"	include debenture stock and debenture stockholder respectively.
"Paid-up"	include credited as paid-up.
"In writing and written"	Includes printing, lithography and other modes of representing or reproducing words, in a visible form.
	Words importing the singular number shall include the plural and vice versa.
	Subject as aforesaid any words or expressions defined in the Statutes shall, if not consistent with the subject or context, bear the same meaning in these Articles.

The marginal notes are inserted for convenience only and shall not affect the construction of these Articles.

BUSINESS

3. Any branch or kind of business which the Company is either expressly or by implication authorised to undertake may be undertaken by the Board to such extent and at such time or times as they shall think fit, and further may be suffered by them to be in total or partial abeyance whether such branch or kind of business may have been actually commenced or not, so long as the Board may deem it expedient not to commence or proceed with the same.

Business

CAPITAL

The Share Capital of the Company is Rs.150 million (Rupees one hundred fifty million) divided into 15 million ordinary shares of Rs.10/- each.

Shares

5. The Company shall not issue partly paid shares.

6. No part of the funds of the Company shall be employed in the purchase of or in loans upon the security of the Company's shares. The Company shall not, except as authorised by the Ordinance, give any financial assistance for the purpose of or in connection with any purchase of shares in the Company.

7. The Company may by Ordinary Resolution in General Meeting from time to time increase its capital by the creation of new shares of such amount as may be deemed expedient.

8. The minimum subscription on which the Directors may proceed to allotment is Rs. 5,000,000 (Rupees five million). The Directors shall, as regards any offer or allotment of shares, comply with the provisions of the Ordinance, if and so far as such provisions may be applicable thereto.

9. In addition to all other powers of paying commissions, the Company may exercise the powers of paying commissions conferred by section 82. The rate per cent or the amount of the commission paid or agreed to be paid shall be disclosed in the manner required by the said section and shall not exceed the rate as may be listed under the section. The Company may also on any issue of shares pay such brokerage as may be lawful provided that such brokerage shall not exceed 1% (One) per cent on the shares debenture or debenture-stock paid up.

10. If any shares of the Company are issued for the purpose of raising money to defray the expenses of the construction of any works or building or the provision of any plant which cannot be made profitable for a lengthened period, the Company may, subject to the conditions and restrictions mentioned in the Ordinance, pay interest on so much such share capital as is for the time being paid up and may charge the same to capital as part of the cost of construction of the works, building or plant.

Capital

Increase of capital and how carried into effect.

Shares at the disposal of the Directors.

Power to pay commission and brokerage.

Power to charge interest to capital.

Exclusion of
equities.

11. No person shall be recognised by the Company as holding any share upon any trust and the Company shall not be bound by or recognise any equitable, contingent, future or partial interest in any share, or any interest in any fractional part of a share or (except only as by these Articles otherwise provided or as by law required or under an order of court) any other right in respect of any share, except an absolute right to the entirety thereof in the registered holder.

CERTIFICATES

Issue of
Certificates.

12. Every person whose name is entered as a member in the register of members shall be entitled without payment to receive within 90 days after allotment or within 45 days of lodgement of transfer, one certificate for all his shares of any one class, or upon payment of such sum, not exceeding one rupee, for every certificate after the first as the Directors shall from time to time determine, to several certificates, each for one or more of his shares of any one class. Where a member transfers part only of the shares comprised in a certificate the old certificate shall be cancelled and a new certificate for the balance of such shares issued in lieu without charge. Every certificate shall be issued under the seal and bear the autographic signatures required by Articles 107 hereof, and shall specify the shares or securities to which it relates and the amount paid up thereon. In the case of a share held jointly by several persons the Company shall not be bound to issue more than one certificate therefore, and delivery of a certificate for a share to one of several joint holders shall be sufficient delivery to all.

Renewal of
Certificates.

13. If a share certificate be defaced, worn out, lost or destroyed, it may be renewed on payment of such fee (if any) on such terms (if any), as to evidence and indemnity and the payment of out of pocket expenses of the Company in investigating evidence, as the Directors think fit.

VARIATION OF RIGHTS

How special
right of
shares may
be varied.

14. Whenever the share capital is divided into different classes of shares, all or any of the rights and privileges attached to each class may be modified by agreement between the Company and any person purporting to contract on behalf of that class, provided such agreement is confirmed by a Special Resolution passed at a separate General Meeting of the holders of shares of that class, and all the provisions herein contained as to General Meetings shall mutatis mutandis apply to every such meeting but so that the quorum thereof shall be two persons at least holding or representing by proxy shares of that class.

TRANSFER OF SHARES

Form of
Transfer.

15. The transfer of shares shall be effected by an instrument in writing in the usual common form, modified so as to suit the circumstan-

ces of the parties, and shall be executed both by the transferor and the transferee whose execution shall be attested by at least one witness who shall add his address and occupation, and the transferor shall be deemed to remain the holder of such shares until the name of the transferee shall have been entered in the register in respect thereof.

16. Whenever shares of different classes have been issued a separate instrument of transfer shall be required for each class of share unless the Directors resolve otherwise.

Form of transfer for different shares.

17. The Directors may decline to recognise any instrument of transfer unless:

(A) such fee, not exceeding two rupees, as the Directors may from time to time require is paid to the Company in respect thereof:

Fee payable.

(B) the instrument of transfer is deposited at the office or such other place as the Directors may appoint, accompanied by the certificate or certificates of the shares to which it relates, and such other evidence (if any) as the Directors may reasonably require to show the right of the transferor to make the transfer, and if the instrument of transfer is executed by some other person on his behalf, the authority of that person so to do.

Deposit of transfer.

18. If the Directors refuse to register a transfer they shall within 30 days after the date on which the transfer was lodged with the Company send to the transferee notice of the refusal indicating the defect or invalidity to the transferee, who shall after removal of such defect or invalidity be entitled to re-lodge the transfer deed with the Company.

Notice of refusal to transfer.

19. The Directors may on giving seven days previous notice by advertisement in newspapers as are specified in section 151 close the transfer books and register of members during such time as the Directors think fit not exceeding in the whole forty-five days in each year, and not exceeding thirty days at a time.

Closing of Register.

TRANSMISSION OF SHARES

20. In the case of the death of a shareholder the survivor or survivors where the deceased was a joint holder, and executors or administrators of the deceased where he was a sole or only surviving holder, shall be the only persons recognised by the Company as having any title to his shares, but nothing herein contained shall release the estate of a deceased holder (whether sole or joint) from any liability in respect of any share solely or jointly held by him.

Transmission on death.

Registration
of executors
and assigns
of insolvents.

21. Any person becoming entitled to a share in consequence of the death bankruptcy or insolvency of a member may, subject as herein-after provided, either to be registered himself as holder of the share upon giving to the Company notice in writing of such desire, or transfer such share to some other person. All the limitations, restrictions, and provisions of these Articles relating to the right to transfer and the registration of transfers of shares shall be applicable to any such notice of transfer as aforesaid as if the death or insolvency of the member had not occurred and the notice of transfer were a transfer executed by such member.

Duties of
personal
representatives
prior to
registration.

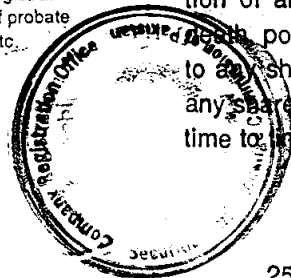
22. The Company shall not be bound to recognise an executor or administrator unless he shall have obtained probate or letters of administration or other legal representation, as the case may be, valid and having effect in Karachi provided nevertheless that it shall be lawful for the Directors in their absolute discretion to dispense with the production of probate or letters of administration or such other legal representation upon such terms as to indemnity or otherwise as the Directors may decide.

Rights of
unregistered
executors
and trustees.

23. Save as otherwise provided by or in accordance with these Articles, a person becoming entitled to a share in consequence of the death or insolvency of a member shall be entitled to receive and may give a discharge for all dividends and other moneys payable in respect of the shares, and shall be entitled to attend and vote at any General Meeting as if he were the registered holder of such share, provided that forty-eight hours at least before the time of holding the meeting or adjourned meeting at which he proposes to vote he shall satisfy the Directors as to his rights, or the Directors shall have previously admitted his rights, to vote at every meeting in respect thereof.

Fee for
registration
of probate
etc.

24. There shall be paid to the Company in respect of the registration of any probate, letter of administration, certificate of marriage or death, power of attorney or other document relating to or affecting the title to any shares or for making any entry in the register affecting the title of any share, such fee, not exceeding two rupees, as the Directors may from time to time require or prescribe.



JOINT HOLDER

25. Where two or more persons are registered as the holders of any share they shall be deemed to hold the same as joint tenants with benefit of survivorship subject to the following and other provisions contained in these Articles:

- (a) The Directors shall be entitled to decline to register more than four persons as the joint holders of any Share.
- (b) The joint holders of any Share shall be liable severally as well as jointly for and in respect of all calls and other payments which ought to be made in respect of such Shares.

- (c) On the death of any such joint holder the survivor shall be the only person or persons recognised by the Company as having any title to the Share but the Directors may require such evidence of death as they may deem fit, and nothing herein contained shall be taken to release the estate of a deceased joint holder from any liability on Shares held by him jointly with any other person.
- (d) Only the person whose name stands first in the Register of Members as one of the joint holders of any Share shall be entitled to delivery of the Certificates relating to such Share or to receive notice from the Company, and any notice given to such person shall be deemed notice to all the joint holders.
- (e) Any one or two or more joint holders may vote at any Meeting either personally or by an agent duly authorised under a power of attorney or by proxy in respect of such Share as if he were solely entitled thereto, and if more than one of such joint holders be present at any Meeting personally or by proxy or by attorney then that one of such persons so present whose name stands first or higher (as the case may be) on the Register in respect of such Share shall alone be entitled to vote in respect thereof. Provided always that a person present at any Meeting personally shall be entitled to vote in preference to a person present by any agent duly authorised under Power of Attorney or by proxy although the name of said person so present by an agent or proxy stands first in the Register in respect of such Shares. Several executors or administrators of a deceased Member in whose (deceased Member's) sole name any Share stands shall for the purpose of this Article be deemed joint holders.

ALTERATION OF CAPITAL

26. The Company in General Meeting may from time to time by Ordinary Resolution increase its capital by such sum to be divided into shares of such amounts as the resolution shall prescribe.

Power to increase capital.

27. Unless otherwise determined by the Company in General Meeting any original shares for the time being un-issued and any new shares from time to time to be created shall be offered to the members in proportion, as nearly as may be to the number of shares held by them. Such offer shall be made by notice specifying the number of shares to which the member is entitled, and limiting a time within which the offer, if not accepted, will be deemed to be declined and after the expiration of such time, or on the receipt of an intimation from the member to whom the offer is made that he declines to accept the shares offered, the Directors may, subject to these Articles, dispose of the same in such manner as

Allotment of new shares.

they think most beneficial to the Company. The Directors may, in like manner, dispose of any such new or original shares as aforesaid which, by reason of the proportion borne by them to the number of persons entitled to such offer as aforesaid or by reason of any other difficulty in apportioning the same, cannot in the opinion of the Directors be conveniently offered in manner hereinbefore provided.

Rights and liabilities attached to new shares.

28. All new shares shall be subject to the provisions of these Articles with reference to transfer, transmission or otherwise.

29. The Company may be Ordinary Resolution:-

Power to consolidate shares.

(a) consolidate and divide all or any of its share Capital into shares of large amount than its existing shares (subject, nevertheless to the provisions of section 92 of the Ordinance).

Power to cancel shares.

(b) cancel any shares which, at the date of the passing of the resolution, have not been taken or agreed to be taken by any person and diminish the amount of its capital by the amount of the shares so cancelled; or

Power to sub-divide shares.

(c) sub-divide its shares, or any of them into shares of smaller amount than is fixed by the Memorandum of Association (subject, nevertheless, to the provisions of section 92 of the Ordinance).

Power to reduce capital.

30. Subject to confirmation by the Court, the Company may by Special Resolution reduce its share capital in any manner authorised by the Ordinance.

BORROWING POWERS

31. The Directors may, from time to time at their discretion borrow or raise any sums of money for the objects and purposes of the Company from its Directors and Chief Executive subject to the provisions of the Ordinance or from any other person, Bank, Firm, Corporation or Company and may secure the repayment of such sum or sums together with interest and payment of commissions, costs, expenses, fees, charges and other dues in such manner and on such terms and conditions in all respects as they think fit and in particular by the issue of debentures and debenture stock which may be convertible into shares of the Company or non-convertible; charged or not charged upon the undertaking and the present and future assets and properties of the Company and with or without rights, privileges and concessions attached to them; by making or endorsing on behalf of the Company Promissory Notes or Bills of Exchange or causing the issue of Usance Bills; by assigning in favour of the Creditor the benefits of contracts and furnishing any guarantee, undertaking or other security; by creating a mortgage, hypothecation and charge

on the properties, assets and rights of the Company (both present and future) by issuing share option certificates and depositing title deeds, marketable securities and cash with the creditor; by executing in favour of the creditor any irrevocable general power of attorney as may be required in any transaction. Provided that, except with the sanction of the Company in General Meeting the amount borrowed by the Company and outstanding at any time shall not exceed the paid-up capital and general reserve of the Company for the time being but provided further that no lender or any other person dealing with the Company shall be bound to see or enquire whether this limit is observed nor will any such person or transaction be adversely affected by the non-observance of such limit. The Directors also may guarantee the whole or any part of any loan or debt raised for the Company.

32. Debentures, debenture stock, bonds and other securities may be made assignable free from any equities between the Company and the person to whom the same may be issued.

Securities
may be
assignable
free from
equities

REDEEMABLE CAPITAL

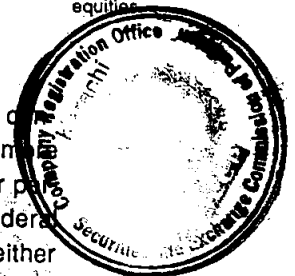
33. (1) The Company may, upon terms and conditions contained in an agreement in writing, issue to one or more scheduled banks, financial institutions or such other persons as are specified for the purpose by the Federal Government by notification in the official Gazette, either severally, jointly or through their syndicate, any instrument in the nature of redeemable capital in any of several forms in consideration of any funds, monies and accommodations received or to be received by the company, whether in cash or in specie or against any promise, guarantee, under-taking or indemnity issued to or in favour of or for the benefit of the Company.

(2) In particular and without prejudice to the generality of the foregoing provisions, the agreement referred to in clause (1) for redeemable capital may provide for, adopt or include, in addition to others, all or any of the following matters, namely:-

(a) mode and basis of repayment by the company of the amount invested in redeemable capital within a certain period of time;

(b) arrangement for sharing of profit and loss;

(c) creation of a special reserve called the "participation reserve" by the company in the manner provided in the agreement for the issue of parti-



icipatory redeemable capital in which all providers of such capital shall participate for interim and final adjustment on the maturity date in accordance with the terms and conditions of such agreements; and

- (d) in case of net loss on participatory redeemable capital on the date of maturity, the right of holders to convert the outstanding balance of such capital or part thereof as provided in the agreement into ordinary shares of the Company at the break-up price calculated in the manner prescribed by the Ordinance or rules made thereunder.

- (3) Where the authorised capital of the Company is fully subscribed, or the unsubscribed capital is insufficient, the same shall be deemed to have been increased to the extent necessary for issue of shares to a scheduled bank or financial institution in pursuance of any obligation of the Company to issue shares to such scheduled bank or financial institution.

Issue of
discount
special
privileges.

34. Subject to the provisions of the Ordinance any debentures, debenture stock, bonds or other securities may be issued at a discount, premium or otherwise and with any special privileges as to redemption, surrender, drawings, allotment of shares, attending and voting at General Meetings of the Company, appointment of Directors and otherwise.

35. Notwithstanding anything contained in these articles the company may issue ordinary shares or grant option to convert into ordinary shares the outstanding balance of any loans, advances or credit, as defined in the Banking Companies Ordinance, 1962 (LVII of 1962), or other non-interest bearing securities and obligations outstanding or having a term of not less than three years in the manner provided in any contract with any scheduled bank or a financial institution to the extent of twenty per cent of such balance:

Provided that such shares shall not be issued or option to convert the outstanding balance exercised unless in any two of the preceding three years after expiry of two years from the date of commencement of commercial production, the return on such non-interest bearing securities, obligations, loans, advances or credit has fallen below the minimum rate of return laid down by the State Bank of Pakistan for the said years.

GENERAL MEETINGS

Statutory
General
Meeting.

36. The Statutory General Meeting of the Company shall be held within the period required by Section 157 of the Companies Ordinance, 1984.

37. An Ordinary General Meeting shall be held within eighteen months of the date of incorporation of the Company and thereafter once at least in every calendar year, within a period of not more than fifteen months after the holding of the last preceding Annual General Meeting and not later than six months after the close of financial year and subject to provisions of section 158 at such time and place as may be determined by the Directors.

Annual
General
Meetings.

38. The meetings referred to in Articles 36 and 37 shall be called general meetings. All other meetings shall be called extra-ordinary meetings.

Nomenclature
of meetings.

39. The Directors may whenever they think fit, and shall on requisition in accordance with the Ordinance proceed to convene an Extra-ordinary General Meeting.

Extra-Ordinary
Meetings.

40. Twenty-one days' notice at the least (exclusive of the day on which it is served or deemed to be served and of the day for which it is given) specifying the place, the day and the hour of meeting, and, in the case of special business, the general nature of such business and in the case of a meeting convened for passing a Special Resolution, the intention to propose such resolution as a Special Resolution shall be given in manner hereinafter mentioned to such persons as are under the provisions of section 160 entitled to receive notices from the Company: provided that the accidental omission to give notice to, or the non-receipt of notice by, any member shall not invalidate the proceedings at any General Meeting.

Notice of
General
Meetings
required.

41. All business shall be deemed special that is transacted at an Extra-ordinary General Meeting and also all business that is transacted at Annual General Meeting, that the exception of sanctioning dividends, the reading, consideration and adoption of the accounts and balance sheet and the reports of the Directors and Auditors and other documents required to be annexed to the balance sheet, the election of Directors, the appointment of Auditors and the fixing of their remuneration, and the voting of extra remuneration to the Directors under Article 67 hereof.

Special
Business.

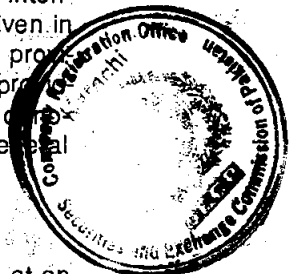
PROCEEDINGS AT GENERAL MEETINGS

42. No business shall be transacted at any general meeting unless a quorum of members is present at that time when the meeting proceeds to business; save as herein otherwise provided, members having twenty-five per cent of the voting power present in person or through proxy; and three members personally present shall be a quorum.

Quorum.

43. If within half an hour from the time appointed for the meeting a quorum is not present, the meeting, if convened on the requisition of

Adjournment
if quorum not
present.



members, shall be dissolved. In any other case it shall stand adjourned to the same day in the next week, at the same time and place, and if at such adjourned meeting a quorum is not present within half an hour from the time appointed for holding the meeting, the members present being not less than two shall be a quorum.

Election of
Chairman.

44. The Chairman of the Board of Directors shall preside at every General Meeting of the Company. If at any meeting the Chairman is not present within fifteen minutes after the time appointed for holding the meeting, or be unwilling to act as Chairman, the members present shall choose some Director or, if no Director be present or if all the Directors present decline to take the chair, the members present shall choose one of their members to be Chairman.

Adjournments
and notice
thereof.

45. The Chairman may, with the consent of any meeting at which a quorum is present (and shall, if so directed by the meeting), adjourn the meeting from time to time and from place to place, but no business shall be transacted at any adjourned meeting except business which might lawfully have been transacted at the meeting from which the adjournment took place. When a meeting is adjourned for fourteen days or more, notice of the adjourned meeting shall be given as in the case of an original meeting. Save as aforesaid, it shall not be necessary to give any notice of an adjournment or of the business to be transacted at an adjourned meeting.

Demand of
Poll.

46. At any General Meeting a resolution put to the vote of the meeting shall be decided on a show of hands unless a poll is (before or on the declaration of the result of the show of hands) demanded by the Chairman (being a person entitled to vote) or by at least five members or by a member or members holding or represented by proxy and entitled to vote in respect of one-tenth part of the capital represented at the meeting. The demand for a poll may with the consent of the Chairman of the meeting be withdrawn.

Declaration
of Chairman
conclusive.

47. Unless a poll is demanded, a declaration by the Chairman that a resolution has been carried, or carried unanimously, or by a particular majority, or lost, and an entry to that effect in the minute book, shall be conclusive evidence of the fact without proof of the number or proportion of the votes recorded in favour of or against such resolution.

Result of
Poll.

48. If a poll be duly demanded the result of the poll shall be deemed to be the resolution of the meeting at which the poll was demanded.

Casting vote
of Chairman.

49. In the case of an equality of votes on any resolution, whether on a show of hands or upon a poll, the Chairman shall have a second or casting vote.

50. A poll demanded on the election of a Chairman, or on a question of adjournment, shall be taken forthwith. A poll demanded on any other question shall be taken at such time and place and in such manner as the Chairman directs.

When poll is to be taken.

51. The demand for a poll shall not prevent the continuance of a meeting for the transaction of any business other than the question on which the poll has been demanded.

Continuance of business after demand for poll.

52. Any Corporation holding shares conferring the right to vote may by resolution of its Directors or other governing body authorise such person as it thinks fit to act as its representative at any meeting of the Company, or at any meeting of holders of any class of shares of the Company, and the person so authorised shall be entitled to exercise the same powers on behalf of the Corporation which he represents as that corporation could be exercised if it had been an individual member of the Company.

Representative of Corporations holding of shares.

VOTES OF MEMBERS

53. Subject and without prejudice to any special privileges or restrictions as to voting for the time being attached to any special class of shares for the time being forming part of the capital of the Company, on a show of hands every member present and entitled to vote shall have one vote, and on a poll every member present in person or by proxy shall have one vote for every share of which he is holder; provided that for election of directors the provisions of section 178 shall apply.

Voting rights on a show of hands.

54. In the case of joint holders of a share the vote of the shareholder who tenders a vote, whether in person or by proxy, shall be accepted to the exclusion of the votes of the other joint holders' and for this purpose seniority shall be determined by the order in which the names stand in the register of members.

Voting rights of joint holders.

55. A member of unsound mind, or in respect of whom an order has been made by any court having jurisdiction in lunacy, may vote, whether on a show of hands or on a poll, by his committee, curator bonis, appointed by such court, and such committee, curator bonis, or other person may on a poll vote by proxy, provided that such evidence as the Directors may require of the authority of the person claiming to vote shall have been deposited at the office or at such other place as the Directors may appoint not less than forty-eight hours before the time for holding the meeting.

Voting rights of lunatic members.

56. No objection shall be raised to the qualification of any vote except at the meeting or adjourned meeting at which the vote objected to is given or rendered, and every vote not disallowed at such meeting shall be valid for all purposes. Any objections made under the provisions of this Article shall be referred to the Chairman of the meeting whose decision

Objections.

shall be final and conclusive.

Votes on a
poll.

57. On a poll vote may be given either personally or by proxy.

Execution
of proxies.

58. The instrument appointing a proxy shall be in writing under the hand of the appointor or of his attorney duly authorised in writing, or if the appointor is a corporation either under the common seal or under the hand of an officer or attorney so authorised.

Deposit of
proxies.

59. The instrument appointing a proxy and the power of attorney or other authority (if any) under which it is signed, or a notarially certified copy of such power or authority, shall be deposited at the office or such other place as the Directors may appoint not less than forty-eight hours before the time appointed for holding the meeting or adjourned meeting at which the person named in the instrument proposes to vote and in default thereof the instrument of proxy may at the discretion of Directors be treated as invalid. The proxy shall be deemed to include the right to demand or join in demanding a poll and generally to act at the meeting for the member giving the proxy.

Form of
instrument
of proxy.

60. An instrument of proxy may be in the following form or in any other form which the Directors shall approve:

SHAHTAJ SUGAR MILLS LIMITED

I _____ of _____ in the district of _____
being a member of Shahtaj Sugar Mills Limited hereby appoint _____
of _____ as my proxy to vote for me and on my
behalf at the annual/extra-ordinary general meeting of the Company to be
held on this _____ day of _____ and at any adjournment thereof.

Intervening
death of
insanity of
Principal
not to
revoke proxy.

61. A vote given in accordance with the terms of an instrument of proxy shall be valid notwithstanding the previous death or insanity of the principal or revocation of the proxy, or of the authority under which the proxy is given, provided that no intimation in writing of such death, insanity, revocation or transe shall have been received by the Company at the office before the commencement of the meeting or adjourned meeting at which the proxy is used.

DIRECTORS

Number of
Directors.

62. Unless and until otherwise determined by the Company in General Meeting the number of Directors shall not be less than Seven or more than twelve. The Directors of the Company shall fix the number of Directors to be elected not later than thirty-five days before the convening of the General Meeting at which the Directors are to be elected and the number so fixed shall not be changed except with the prior approval of a General Meeting of the Company.

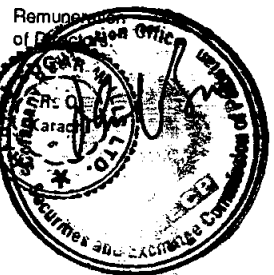
63. The qualification of a Director shall be his holding shares of the value of Rs. 5,000/- at least in his own name, relaxable in case of a Director representing interest holding shares of the requisite value.

Qualification
of Directors.

64. Any trust deed for securing debentures or debenture stock may, if so arranged, provide for the appointment from time to time, by the trustees thereof or by the holders of the debenture stock, of some person or persons to be a Director or Directors of the Company and may empower such trustees or holders of debentures or debenture stock from time to time to remove any Director so appointed. The Director appointed under this Article is herein referred to as the "Debenture Director." The Debenture Director shall not be bound to hold any qualification shares and shall not be liable to retire by rotation or be removed by the Company. The Trust Deed may contain such ancillary provisions as may be arranged between the Company and the trustees and such provisions shall have effect notwithstanding any of the other provisions herein contained.

Debenture
Director.

65. The remuneration of a Director shall from time to time be determined by the Company in General Meeting but the remuneration of a Director, for attending the meeting of the Board and of its Committee shall not exceed Rs. 10,000 per meeting attended by him. The Company in General Meeting may also



vote extra remuneration to the Board, or any member of the Board and either for one year or any longer or shorter period.

66. The Directors may repay to any Director all such reasonable expenses as he may incur in attending meetings or the Board, or of Committees of the Board, or the General Meetings, or which he may otherwise incur in or about the business of the Company.

Travelling
expenses.

67. A Director who serves on any Committee, or who devotes special attention to the business of the Company or who otherwise performs services which in the opinion of the Board are outside the scope of the ordinary duties of a Director, may be paid such extra remuneration by way of salary, percentage of profits or otherwise as the Board of Directors may determine, which shall be charged as part of the Company's ordinary working expenses.

Extra
remuneration.

68. Subject to the provisions of Section 188(i) (c) of the Ordinance, a Director may, hold any other office or place of profit under the Company (other than that of Auditor) and he or any firm of which he is a member may set in a professional capacity for the Company in conjunction with his office of Director on such terms as the tenure of office, remuneration and otherwise as the Directors may from time to time determine.

Power of
Directors to
hold offices
of profit
with company.

69. Subject to the provisions of Section 196(2) (g) of the Ordinance, no Director or intending Director shall be disqualified from his of-

Director may
contract
with the
Company.

fice by contracting with the Company nor shall any contract or arrangement entered into by or on behalf of the Company in which any Director is in any way interested be liable to be avoided, nor shall any Director so contracting or being so interested be liable to account to the Company for any profit realised by any such contract or arrangement by reason of such Director holding that office, or of the fiduciary relation thereby established, provided that the nature of his interest in such contract or proposed contract or arrangement be declared at the meeting of the Directors at the time specified in section 214(2) of the Ordinance. No Director shall vote as a Director in respect of any contract or arrangement in which he shall be interested, but this prohibition shall not apply to any contract of indemnity against loss which he may suffer by reason of becoming a surety for the Company.

Holding of
concurrent
office.

70. A Director may be or become a Director or other officer of, or otherwise interested in, any company promoted by the Company or in which the Company may be interested as shareholder or otherwise, and unless otherwise agreed shall not be accountable for any remuneration or other benefits received by him as a Director or officer of or by virtue of his interest in such other Company.

First
Directors.

71. The first Directors shall be appointed by an instrument in writing signed by the subscribers to the Memorandum of Association.

Election and
removal of
Directors.

72. Subject to the provisions of Article 62, the Directors other than the first Directors shall be elected by the members of the Company in General Meeting in the manner laid down in Section 178 of the Ordinance.

73. A retiring director shall be eligible for re-election.

74. The Company shall comply with the provisions of Section 174 to 178 and sections 180 and 184 relating to the election of directors and matters ancillary thereto.

Increase in
number of
Directors.

75. Subject to the provisions of the Ordinance, the company may from time to time in annual general meeting increase the number of directors.

Casual
vacancy.

76. Any casual vacancy occurring on the board of directors may be filled up by the directors, but the person so chosen shall be subject to retirement at the same time as if he had become a director on the day on which the director in whose place he is chosen was last elected as director.

Removal of
Director.

77. The Company may remove a Director but only in accordance with the provisions of the Ordinance.

78. Any appointment of a Director may be made in contemplation of the occurrence of a vacancy to take effect upon the actual occurrence of such vacancy.

Appointment in contemplation of vacancy.

79. No person shall be appointed as a director of a company if he:-

Ineligibility of certain person to become director.

- (a) is a minor;
- (b) is of unsound mind;
- (c) has applied to be adjudicated as an insolvent and his application is pending;
- (d) is an undischarged insolvent;
- (e) has been convicted by a court of law for an offence involving moral turpitude;
- (f) has been debarred from holding such office under any provision of this Ordinance;
- (g) has betrayed lack of fiduciary behaviour and a declaration to this effect has been made by the court under section 21 at any time during the preceding five years;
- (h) is not a member;

provided that clause (h) shall not apply in the case of:-

- (i) a person representing the Government or an institution or authority which is a member;
- (ii) a whole-time director who is an employee of the company;
- (iii) a chief executive; or
- (iv) a person representing a creditor.

80. A director shall ipso facto cease to hold office if :-

Vacation of office by the directors.

- (a) he becomes ineligible to be appointed a director on anyone or more of the grounds enumerated in clauses (a) to (h) of section 187.
- (b) he absents himself from three consecutive meetings of the directors or from all the meetings of the directors for a continu-



ous person of three months, whichever is the longer, without leave of absence from the directors;

(c) he or any firm of which he is a partner or any private company of which he is a director.

(i) without the sanction of the Company in general meeting accepts or holds any office of profit under the Company other than that of Chief Executive or a legal or technical adviser or a banker; or

(ii) accept a loan or guarantee from the Company in contravention of Section 195.

Tenure of
Directors
and Chief
Executive.

81. A Director, including the Chief Executive, shall hold office for a period of three years unless he earlier resigns or becomes disqualified for being a Director or otherwise ceases to hold the office.

Notice of
intention
to contest
election
of Director.

82. No person shall be eligible for election to the office of Director at any General Meeting unless not less than fourteen or more than twenty-one clear days before the day appointed for the meeting, there shall have been given to the Secretary, notice in writing, signed by that person of his intention to offer himself for election as Director. All such notices shall be transmitted by the Company to the members not later than seven days before the said meeting.

Proceedings
in case of
vacancies.

83. The continuing Directors may act notwithstanding any vacancies, but if and so long as the number of Directors is reduced below the minimum number fixed by or in accordance with these Articles the continuing Directors or Director may act for the purpose of filling up vacancies or of summoning General Meetings of the Company, but not for any other purpose. If there be no Directors or Director able or willing to act, then any two members may summon a General Meeting for the purpose of appointing Directors.

Validity of
acts of
Directors in
spite of
some formal
defect.

84. All acts done by any meeting of Directors, or of a Committee of Directors, or by any person acting as a Director, shall as regards all persons dealing in good faith with the Company, notwithstanding that there was some defect in the appointment of any such Director or person acting as aforesaid, or that they or any of them were disqualified or had vacated office, or were not entitled to vote, be as valid as if every such person had been duly appointed and was qualified and had continued to be a Director and had been entitled to vote.

Eligible for
re-election.

85. A retiring Director shall be eligible for re-election.

POWERS AND DUTIES OF DIRECTORS

86. The control of the Company is vested in the Directors who in addition to the powers and authorities by these presents or otherwise expressly conferred upon them may exercise all such powers and do all such acts and things as may be exercised or done by the Company and are not hereby or by law expressly directed or required to be exercised or done by the Company in General Meeting, but subject to the provisions of any law and of these presents and to any regulations not being inconsistent with these presents from time to time made by the Company in General Meeting, provided that no regulations so made shall invalidate any prior act of the Directors which would have been valid if such regulations had not been made.

General
Power of
Company
vested in
Directors.

87. The Directors may meet together for the despatch of business, adjourn and otherwise regulate their meetings as they think fit. A Director may, and the Secretary on the requisition of a Director shall, at any time summon a meeting of the Directors. Notice of meetings of the Directors shall be sent to all Directors in Pakistan.

Board
Meeting.

88. The Directors shall meet at least twice in a year.

The Chairman of the Board of Directors (elected by the Directors) shall preside at the meeting of the Board and if at any meeting the Chairman is not present within Fifteen (15) minutes after the time appointed for holding the same, the Directors present may choose one of their members to be the Chairman of the Meeting.

Chairman.

89. Questions arising at any meeting shall be determined by a majority of votes. In case of an equality of votes the Chairman shall have a second or casting vote.

Casting vote
of Chairman.

90. The Directors may delegate any of their powers, other than the powers to borrow, to a committee consisting of such number of members of their body as they think fit. Any committee so formed shall, in the exercise of the powers so delegated, conform to any regulations that may be imposed on them by the Directors.

Power to
appoint
committee.

91. A meeting of the Board for the time being at which a quorum is present shall be competent to exercise all powers and discretions for the time being exercisable by the Board. The quorum of Directors' Meeting shall be not less than one third of their number or four whichever be greater. If all the directors except one are disqualified from voting, the matter shall be decided in General Meeting.

Quorum.

92. The meetings and proceedings of any such committee consisting of two or more members shall be governed by the provisions of these Articles regulating the meetings and proceedings of the Directors, so far as the same are applicable and are not superseded by any regulations made by the Directors under the last preceding Article.

Proceedings
at committee
meeting.

Resolution
in writing.

93. A resolution in writing signed by the majority of the Directors for the time being entitled to receive notice of Board Meetings shall be as valid and effectual as if the same had been passed at a Board Meeting duly convened and held.

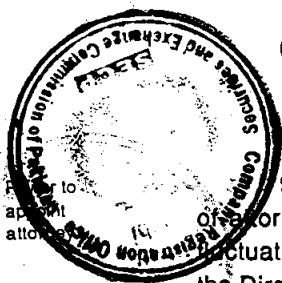
Resolutions
in writing
in several
documents.

94. A resolution in writing signed by all the Directors shall be as effective as a resolution passed at a meeting of the Directors duly convened and held, and may consist of several documents in the like form, each signed by one or more of the Directors.

Minutes.

95. The Directors shall cause minutes to be made in books to be provided for the purpose :-

- (1) of all appointments of officers made by the Directors;
- (2) of the names of the Directors present at each meeting, of Directors and of any committee of Directors;
- (3) of the names of the participants of General Meeting; and
- (4) of all resolutions and proceedings at all meetings of the Company and of any class of members of the Company and of the Directors and of committees of Directors.



96. The Directors may from time to time and at any time by power of attorney under the seal appoint any company, firm or person or any acting body of persons, whether nominated directly or indirectly by the Directors, to be the Attorney or Attorneys of the Company for such purposes and with such powers, authorities and discretions (not exceeding those vested in or exercisable by the Directors under these Articles) and for such period and subject to such conditions as they may think fit, and any such power of attorney may contain such provisions for the protection and convenience of persons dealing with any such Attorney as the Directors may think fit, and may also authorise any such Attorney to sub-delegate all or any of the powers, authorities and discretions vested in him.

Establishment
and maintenance
of pension
scheme.

97. The Directors may admit any number of the staff, including Chief Executive or salaried Director who is in the whole-time employment of the Company or of any of its subsidiary or associated companies, notwithstanding that he is a Director, to participate in staff pension and/or life assurance scheme of the company.

Power to pay
retiring
allowances.

98. The Directors may, at their discretion, fix and pay pensions or allowances to any retired member of the staff, including, Chief Executive or retired salaried Director who shall have been in the whole-time employment of the Company or of any of its subsidiary or associated companies for a period of at least five years, and to any dependents of any such

member of the staff after his death.

99. All cheques, promissory notes, drafts, bills of exchange and other negotiable or transferable instruments, and all receipts for monies paid to the company, shall be signed, drawn, accepted, endorsed or otherwise executed, as the case may be, in such manner as the Directors shall from time to time by resolution determine.

Signature of
cheques and
bills.

100. The Directors shall duly comply with the provisions of the Ordinance, and in particular the provisions in regard to registration of charges created by or affecting property of the Company, in regard to keeping a register of Directors, a register of mortgages and charges, and in regards to the production and furnishing of copies of such registers and of any register of holders of debentures of the Company.

Keeping of
Register etc.

101. Any register, index, minute book, book of account or other book required by these Articles or by the Ordinance to be kept by or on behalf of the Company may be kept either by making entries in bound books or by recording them in any other manner. In any case in which bound books are not used, the Directors shall take adequate precautions for guarding against falsification and for facilitating its discovery.

Form of
Registers
etc.

ALTERNATE DIRECTORS

102. Any director may during his absence from Pakistan for not less than three months, by writing under his hand left at the office nominate any other Director or any other person approved by the Board for the purpose of acting as alternate director in his place at any meeting at which he is not present and at his discretion may remove such alternate Director, and on such appointment being made the alternate Director shall except as regards remuneration, be subject in all respects to the terms and conditions existing with reference to the other Directors of the Company, and each alternate Director, while so acting, shall exercise and discharge all the functions, powers and duties of the Director he represents. Any Director also as an alternate Director shall have an additional vote at Board Meetings for each Director for whom he acts as alternate Director. An alternate Director shall ipso facto cease to be an alternate Director if his appointer ceases for any reason to be a Director otherwise than by retiring and being immediately re-appointed.

Provisions for
appointment
and removal
of alternate
Directors



SUBSIDIARY COMPANIES

103. The Directors may arrange that any branch of the business carried on by the Company or any other business in which the Company may be interested shall be carried on by or through one or more subsidiary companies, and they may on behalf of the Company make such arrangements as they think advisable for taking the profits or bearing the losses of any branch or business so carried on or for financing, assisting

Organisation
of subsidiary
companies.

or subsidising any such subsidiary company or guaranteeing its contracts, obligations or liabilities.

Power to establish local boards etc.

104. The Directors may establish any local boards or agencies for managing any of the affairs of the Company, either in Pakistan or elsewhere, and may appoint any persons to be members of such local boards, or any managers or agents, and may fix their remuneration, and may delegate to any local board, manager or agent any of the powers, authorities and discretions vested in the Directors with power to sub-delegate and may authorise the members of any local board, or any of them, to fill any vacancies therein and to act notwithstanding vacancies, and any such appointment or delegation may be made upon terms and subject to such conditions as the Directors may think fit, and the Directors may remove any person so appointed and may annul or vary such delegation, but no person dealing in good faith and without notice of any such annulment or variation shall be affected thereby.

CHIEF EXECUTIVE

Appointment of Chief Executive.

105. The Directors from time to time appoint any person to hold or continue in the office of the Chief Executive in accordance with the provision of Section 198-199 of the Ordinance and shall be paid such remuneration for acting as Chief Executive and will be determined by the Company in the General Meeting.

SECRETARY

Appointment and removal.

106. A Secretary may be appointed by the Directors for such terms, at such remuneration and upon such conditions as they may think fit, and any Secretary so appointed may be removed by them, but without prejudice to any claim he may have for damages for breach of any contract of service between him and the Company.

S E A L

Formalities for affixing seal.

107. The Directors shall provide for the safe custody of the seal which shall not be used except by the authority of the Directors or a Committee of Directors authorised by the Directors in that behalf and in presence of at least two Directors or of one Director and some other persons appointed by the Directors for the purpose who will sign every instrument to which the seal shall be affixed, and as regards any purchaser or person bona fide, dealing with the Company such signature shall be conclusive evidence of the fact that the seal has been properly affixed.

Use of seal abroad.

108. The Company may exercise the power conferred by Section 213 of the Ordinance with regard to having an Official Seal for use abroad, and such powers shall be vested in the Directors.

AUTHENTICATION OF DOCUMENTS

109. The Chief Executive, any Directors or the Secretary or any person appointed by the Directors for the purpose shall have power to authenticate any documents affecting the constitution of the Company and any resolution passed by the Company or the Directors, and any books, records, documents and accounts relating to the business of the Company, and to certify copies thereof or extracts therefrom as true copies or extracts, and where any books, records, documents or accounts are kept elsewhere than at the office the Local Manager for other officer of the Company having the custody thereof shall be deemed to be a person appointed by the Directors as aforesaid.

Power to
authenticate
documents.

110. A document purporting to be a copy of a resolution of the Directors or an extract from the minutes of a meeting of the Directors which is certified as such in accordance with the provisions of the last preceding Article shall be conclusive evidence in favour of all persons dealing with Company upon the faith thereof that such resolution has been duly passed or, as the case may be, that such extract is a true and accurate record of a duly constituted meeting of the Directors.

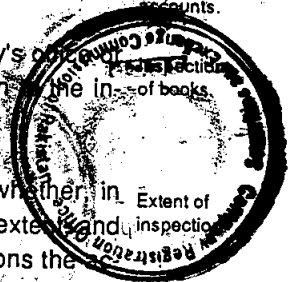
Certified
copies of
resolution
of the
Directors.

ACCOUNTS

111. The Directors shall cause proper books of account to be kept as required by Section 230 of the Ordinance.

Directors to
keep proper
accounts.

112. The books of account shall be kept at the Company's office or at such other place as the Directors think fit, and shall be open to the inspection of the Directors, during business hours.



113. The Directors shall from time to time determine whether in any particular case or class of cases, or generally, and to what extent and at what times and places and under what conditions or regulations the accounts and books of the Company, or any of them, shall be open to the inspection of members, and no member, other than a Director shall have any right of inspecting an account or book or document of the Company except as conferred by Law or authorised by the Directors or by the Company in General Meeting.

Extent of
inspection

114. Once at least in every calendar year the Directors shall lay before the Company in General Meeting a profit and loss account and a balance sheet, both made up to a date not more than six months before the meeting. The Directors shall in preparing every such balance sheet and profit and loss account have regard to the provisions of the Ordinance applicable thereto.

Submission of
Balance Sheet
Profit &
Loss Accounts.

115. Every such balance sheet as aforesaid shall be signed on behalf of the Board by the Chief Executive and one Director, when the Chief Executive is for the time being not in Pakistan then the balance

Signature of
Balance Sheet.

sheet and profit and loss account of the Company shall be signed by not less than two Directors for the time being in Pakistan but in such a case there shall be sub joined to the balance sheet and profit and loss account and statement signed by such Directors explaining the reasons therefore and every such balance sheet of the Company shall have attached to it a report of the Directors as to the state of the Company's affairs and the amount (if any) which they recommend to be paid by way of dividend to the members, and the amount (if any) which they have carried or propose to carry to the reserve fund, general reserve account shown specifically on the balance sheet or to be shown specifically on a subsequent balance sheet. The balance sheet of the Company shall also have attached to it the Auditors' Report.

Copies of
Balance Sheet
Profit & Loss
Accounts and
Report to be
sent to
members.

116. A copy of Directors' Report accompanied by the balance sheet (including every document required by law to be annexed thereto) and profit and loss account shall, at least twenty-one days prior to the Ordinary Meeting be delivered or sent by post to the registered address of every person entitled to receive notice of General Meetings and to every holder of debentures in the Company in the manner in which notices are to be given.

Financial year.

117. The date of the commencement and end of the financial year of the Company shall be fixed and may from time to time be varied by the Board.

A U D I T

Appointment of
Auditors.

118. Auditors shall be appointed and their duties regulated in accordance with Sections 252 to 260 of the Ordinance.

Payment of
dividend.

D I V I D E N D S

119. The Company may by Ordinary Resolution declare dividend but (without prejudice to the powers of the Company to pay interest on share capital as hereinbefore provided) no dividend shall be payable except out of the profits of the Company, or in excess of the amount recommended by the Directors.

What to be
deemed not
profits.

120. The declaration of the Directors as to the amount of the net profit of the Company at any time available for payment of dividends shall be conclusive.

Retention of
dividends on
shares pending
transmission.

121. The Directors may retain the dividend payable on shares in respect of which any person is under the provisions as to the transmission of shares hereinbefore contained entitled to become a member, or which any person under the said provisions relating to transmission is entitled to transfer, until such person shall become a member in respect of such shares or shall duly transfer the same.

122. If and so far as in the opinion of the Directors the profits of the Company justify such payments, the Directors may pay to the holders of any class of share interim dividends thereon of such amounts and on such dates as they think fit.

Payment of
Interim
Dividend.

123. No larger dividend shall be declared than is recommended by the Directors, but the Company in General Meeting may declare a smaller dividend.

Restriction
on amount of
dividend.

124. A transfer of shares shall not pass the rights to any dividend declared thereon before the registration of the transfer.

Effect of
transfer.

125. All dividends unclaimed for one year after having been declared may be invested or otherwise used by the Directors for the benefit of the Company, but the investment or payment of any unclaimed dividend or other monies payable on or in respect of a share into a separate account shall not constitute the Company a trustee in respect thereof. Any dividend unclaimed after a period of six years from the date of declaration of such dividend may be forfeited, and if so shall revert to the Company.

Unclaimed
dividends

126. If several persons are registered as joint holders of any share, or are entitled to a share in consequence of the death or insolvency of the holder, any one of them may give effectual receipts for any dividend or other monies payable on or in respect of the said share.

Dividends due
to joint
holders.

127. Notice of any dividend that may have been declared shall be given in the manner prescribed by these Articles to the members entitled to share therein.

Notice of
dividend.

128. No dividend or other monies payable on or in respect of share shall bear interest as against the Company.

Dividends
not to bear
interest.

129. All dividends shall belong and be paid (subject to the Company's lien) to the members who shall be on the register at the date on which the dividend shall be declared, notwithstanding any subsequent transfer or transmission of shares.

To whom
dividend
payable.

130. Any dividend or other monies payable in cash on or in respect of a share may be paid by cheque or warrant sent through registered post to the registered address of the member or person entitled thereto, or if several persons are registered as joint holders of the share or are entitled thereto in consequence of the death or insolvency of the holder, to any one of such persons or to such persons and at such address as such persons may, by writing, direct. Every such cheque or warrant shall be made payable to the person to whom it is sent or to such person as the holder or joint holders, or persons entitled to the share in consequence of the death or insolvency of the holder, may direct, and payment of the cheque, if purporting to be endorsed, shall be a good discharge to the Company. Every such cheque or warrant shall be sent at the risk of the person entitled to the money represented thereby.

Dividends
payable by
cheque.

Payment of
dividends
in specie

131. The Company may, upon the recommendation of the Directors, by Ordinary Resolution direct payment of a dividend in whole or in part by the distribution of specific assets and in particular of paid-up shares or debentures of any other company or in any one or more of such ways; and the Directors shall give effect to such resolution, and where any difficulty arises in regard to such distribution, the Directors may settle the same as they think expedient, and in particular may issue fractional certificates and fix the value for distribution of such specific assets or any part thereof, and may determine that cash payments shall be made to any members upon the footing of the value so fixed in order to adjust the rights of all parties, and may be the Directors.

132. Any dividend that has been declared shall be paid within the period laid down in section 251 of the Ordinance.

RESERVES

Power to
carry profit
to reserve.

133. The Directors may from time to time set aside out of the profits of the Company and carry to reserve such sums as they think proper, which, at the discretion of the Directors, shall be applicable for meeting contingencies or for the gradual liquidation of any debt or liability of the Company or for repairing or maintaining the works, plant and machinery of the Company or for special dividends or bonuses or for equalising dividends or for any other purpose to which the profits of the Company may properly be applied, and pending such application may either be employed in the business of the Company or be invested. The Directors may divide the Reserve into such special funds as they think fit and may consolidate into one fund, any special funds or any part of any special funds into which the reserve may have been divided. The Directors may also without placing the same to reserve carry forward any profits which they may think it not prudent to divide.

CAPITALISATION OF PROFITS & RESERVES

Power to
capitalize
profit.

134. The Company may, upon the recommendation of the Directors, in a General Meeting resolve that it is desirable to capitalise any sum standing to the credit of any of the Company's reserve accounts (including any share premium account and any capital redemption reserve fund) or any sum standing to the credit of profit and loss account or otherwise available for distribution, provided that such sum be not required for paying the dividends on any shares, and accordingly that the Directors be authorised and directed to appropriate the sum resolved to be capitalised to the members in the proportion in which such sum would have been divisible amongst them had the same been applied or been applicable in paying dividends, and to apply such sum on their behalf, in paying up in full

unissued shares or debentures of the Company of a nominal amount equal to such sum, such shares or debentures to be allotted and distributed credited as fully paid up to and amongst such members in the proportion of aforesaid or partly in one way and partly in the other.

135. Whenever such a resolution as aforesaid shall have been passed the Directors shall make all appropriations and applications of the sum resolved to be capitalised thereby and all allotments and issues of fully paid shares or debentures (if any), and generally shall do all acts and things required to give effect thereto, with full power to the Directors to make such provision by the issue of fractional certificates or by payment in cash or otherwise as they think fit for the case of shares or debentures becoming distributable in fractions and also to authorise any person to enter on behalf of all the members interested into an agreement with the Company providing for the allotment to them respectively, credited as fully paid up of any further shares to which they may be entitled upon such capitalisation, and any agreement made under such authority shall be effective and binding on all such members.

Implementation of resolution to capitalize profits.

SECRET

136. Every Director, Manager, Auditor, Trustee, member of a committee officer, servant, agent, accountant, or other person employed in the business of the Company shall, if so required by the Directors before entering upon his duties, sign a declaration pledging himself to observe a strict secrecy respecting all transactions of the Company with its customers and the state of accounts with individuals and any matters relating thereto, and shall by such declaration pledge himself not to reveal any of the matters which may come to his knowledge in the discharge of his duties except when required so to do by the Directors or by a court of law, and except so far as may be necessary in order to comply with any of the provisions in these provisions contained.

Secrecy

137. No member or other person shall be entitled to enter the property of the Company or to inspect or examine the Company's premises or properties or the books of account of the Company without the permission of the Directors of the Company for the time being or to require discovery of or any information respecting any detail of the Company's trading or any matter which is or may be in the nature of a trade secret, mystery of trade, or secret process or of any matter whatsoever which may relate to the conduct of the business of the Company and which in the opinion of the Directors it will be inexpedient in the interest of the members of the Company to communicate.

No shareholder to enter the Company nor inspect books without permission.

NOTICES

138. A notice may be given by the Company to any member personally or by sending it by post to him at his registered address in Pakistan.

Notice how to serve.

Notices to members having no registered address in Pakistan.

139. A member may give to the Company from time to time an address in Pakistan for the service of notices. If a member has no registered address in Pakistan and has not supplied to the Company an address within Pakistan for the giving of notices to him, a notice forwarded to him by registered airmail to his address outside Pakistan shall be deemed to be duly given to him on the day on which such notice would be delivered in the ordinary course of post.

When service deemed to be effected

140. Where a notice is sent by post, service of the notice shall be deemed to be effected by properly addressing prepaying and posting a letter containing the notice and, unless the contrary is proved, to have been effected at the time at which the letter would be delivered in the ordinary course of post.

Notices in case of death or insolvency.

141. A notice may be given by the Company to the persons entitled to any share in consequence of the death or insolvency of a member by sending it through the post in a prepaid letter addressed to them by name or by the title of representative of the deceased, or assignee of the insolvent, or by any like description, at the address (if any) in Pakistan supplied for the purpose by the persons claiming to be so entitled, or (until such an address has been so supplied) by giving notice in any manner in which the same might have been given if the death or insolvency had not occurred.

How joint holders of shares may be served.

142. All notices directed to be given to the members shall, with respect to any share to which persons are jointly entitled, be given to whichever of such persons is named first in the register of members, and any notice so given shall be sufficient notice to all the holders of such shares.

WINDING UP

Distribution of assets.

143. If the Company shall be wound up and the assets available for distribution amongst the members as such shall be insufficient to repay the whole of the paid up capital, such assets shall be distributed so that as nearly as may be the losses shall be borne by the members in accordance with the rights and interests of the members at the commencement of the winding up and if in a winding up the assets available for distribution among the members shall be more than sufficient to repay the whole of the capital paid up at the commencement of the winding up, the excess shall be distributed amongst the members in accordance with the profits and interests at the commencement of the winding up. But this Article is to be without prejudice to the rights of the holders of shares if and when issued upon special terms and conditions.

Distribution of assets in specie.

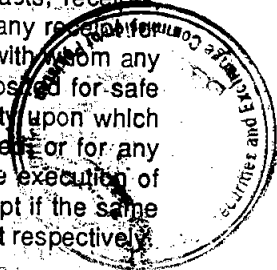
144. If the Company shall be wound up whether voluntarily or otherwise, the Liquidators may, with the sanction of a Special Resolution,

divide among the contributories in specie or kind any part of the assets of the Company, and may with the like sanction vest any part of the assets of the Company in trustees upon such trusts for the benefit of the contributories, or any of them, as the Liquidators with the sanction shall think fit.

INDEMNITY

145. Save and except so far as the provisions of this Article shall be avoided by any provisions of the Ordinance, the Directors Chief Executive, Chief Accountant, Auditors, Secretary and other Officers for the time being of the company and Trustees (if any) for the time being acting in relation to any of the affairs of the Company, and their respective executors or administrators, shall be indemnified and secured harmless out of the assets of the Company from and against all action costs, charges, losses, damages and expenses which they or any of them, their or any of their executors or administrators, shall or may incur or sustain by reason of any act done, concurred in or committed in or about the execution of their duty or supposed duty in their respective offices or trusts, except such (if any) as they shall incur or sustain through their own wilful neglect or default respectively and none of them shall be answerable for the acts, receipts, neglects or defaults of any other of them, or for joining in any receipt or for the sake of conformity or for any bankers or other persons with whom any monies or effects of the Company shall be lodged or deposited for safe custody, or for the insufficiency or deficiency of any security upon which any monies of the Company shall be placed out or invested or for any other loss, misfortune or damage which may happen in the execution of their respective offices or trusts, or in relation thereto, except if the same shall happen by or through their own wilful neglect or default respectively.

Indemnity of
Directors
and Officers.



WE, the several persons, whose names and addresses are subscribed below, are desirous of being formed into a company in pursuance of these Articles of Association and we respectively agree to take the number of shares in the Capital of the Company set opposite our respective names.

Names, addresses and descriptions of Subscribers.	Number of shares taken by each Subscriber.
(RASHEED A. AKHUND) Finlay House, McLeod Road, Karachi. Advocate	ONE
(MUHAMMAD UBAIDUR RAHMAN) Finlay House, McLeod Road, Karachi. Advocate	ONE
(AFTAB AHMED KHAN) Finlay House, McLeod Road, Karachi. Advocate	ONE
(NIZAM AHMED) Finlay House, McLeod Road, Karachi Advocate	ONE
(ISMAIL TEJANI) Finlay House, McLeod Road, Karachi Advocate	ONE
(EHSAN NOMANI) Finlay House, McLeod Road, Karachi Advocate	ONE
(HASAN MAHMOOD) Finlay House, McLeod Road, Karachi Advocate	ONE

DATED the day of 196

WITNESS to the above Signatures :-

(ANVER SALIM)
Finlay House,
McLeod Road, Karachi.
Lawyer

