



**CENTRAL POWER GENERATION COMPANY LIMITED
(GENCO-II)**

**PETITION FOR GRANT OF GENERATION LICENSE FOR THE 747
MW COMBINED-CYCLE POWER PLANT AT GUDDU**



Central Power Generation Company Ltd

Thermal Power Station, Barrage Road, Guddu-79220
Phone: 0722-579088 Fax: 0722-578328
Email: genco2_guddu@yahoo.com



**Office of the
Chief Executive Officer**

No. CPGCL/CEO/

Date: ___/03/2023

The Registrar
National Electric Power Regulatory Authority
NEPRA Tower, Ataturk Avenue (East)
Sector G-5/1, Islamabad

Subject: Application for Grant of Generation License for the 747 MW CCPP, Guddu

I, **Sabeeh Uz Zaman Faruqi**, being the Chief Executive Officer and duly authorized representative of Central Power Generation Company Limited (GENCO-II) by virtue of a resolution in the 134th meeting of CPGCL's Board of Directors dated 03.02.2022 hereby apply to the National Electric Power Regulatory Authority for the grant of a **separate generation license** to Central Power Generation Company Limited pursuant to Section 14B National Electric Power Regulatory Authority Licensing (Application Modification, Extension, and Cancellation) Procedure Regulations, 2021

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 Modification, Extension, and Cancellation) Procedure Regulations, 2021

National Electric Power Regulatory Authority Licensing (Application Modification, Extension, and Cancellation) Procedure Regulations, 2021, 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 bank draft in the sum of **Rs 2,023,100/- (Rupees two million twenty-three thousand and one hundred only)**, being the non-refundable license application fee calculated in accordance with Schedule II to the National Electric Power Regulatory Authority Licensing (Application Modification, Extension, and Cancellation) Procedure Regulations, 2021, is also attached herewith.

Sabeeh Uz Zaman

Engr. Sabeeh Uz Zaman Faruqi
Chief Executive Officer / Authorized Representative

1358-UBL UNITED BANK LTD.
ISSUING BRANCH: ***2,023,100.00*****

CASHIER'S CHEQUE

NATIONAL ELECTRIC POWER REGULATORY or Order
TWO MILLION TWENTY THREE THOUSAND ONE HUNDRED

PAYABLE AT ANY UBL BRANCH IN PAKISTAN
 Valid for Six Months from the date of issue

PLEASE DO NOT WRITE BELOW THIS LINE

Cheque No. 18

Stationery/Ref No:

Date: 1 1 0 2 2 0 2 3
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*****2,023,100.00**

PKR

Signatory PA/Attorney No. [Signature]

Signatory PA/Attorney No. [Signature]

BEFORE THE NATIONAL ELECTRIC POWER REGULATORY AUTHORITY

Petition by the Central Power Generation Company Limited (GENCO-II) for Grant of a Separate Generation License for the 747 MW Combined-Cycle Power Plant at Guddu under section 14B of the Regulation of Generation Transmission & Distribution of Electric Power Act, 1997 read with Regulation 3 of the National Electric Power Regulatory Authority Licensing (Application Modification, Extension, and Cancellation) Procedure Regulations, 2021,

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for the Petitioner

Engr. Sabeeh Uz Zaman Faruqi
Chief Executive Officer
Thermal Power Station Guddu, District Kashmore
Tel: 0722-679088
Fax: 0722-679085
Email: genco2_guddu@yahoo.com, ceo@cpvgl.com

A. General Information of the Petitioner

Name of Petitioner: Central Power Generation Company Limited (GENCO-II).

Registered Address: 197, WAPDA House, Shahrah-e-Quaid-e-Azam, Lahore.

Business Address: Thermal Power Station Guddu, District Kashmore, Sindh.

Plant Location: Guddu, on the right bank of river Indus near Guddu Barrage.

Type of Plant: Combined Cycle Thermal Power Plant with gas turbines, HRSG and steam turbine.

B. Background

1. The 747 MW Combined Cycle Power Plant (the “747MW CCPP”) is located at the Thermal Power Station Guddu, District Kashmore, in the province of Sindh. The Plant achieved commercial operations on 17th December 2014.
2. Central Power Generation Company Limited (“CPGCL”) was issued its Generation License No. GL/02/2002 by the Authority on 1st July 2002 (“Generation License”). On 31st July 2012, CPGCL applied to the Authority to modify its Generation License by adding the 747MW CCPP to CPGCL’s generation facilities, which was accordingly added to CPGCL’s license by the Authority through the first modification to the Generation License issued vide No. NEPRA/R/LAG-01/4191-4193 on 26th April 2013 (“LPM-I”). Under the terms of the LPM-I, the Generation License was made valid until 30th June 2017.
3. Subsequently, the Authority, through determination issued vide No. NEPRA/R/LAG-01/2157-64 dated 10th July 2019 (“LPM-II”) extended the Generation License for the 747MW CCPP up to the year 2042.

B. Petition for Generation License

4. The 747MW CCPP has been on the list of assets that the Government plans to privatize, and the process is presently ongoing under the auspices of the Ministry of Privatisation. In order to facilitate and further the process, the Ministry of Energy (Power Division) directed CPGCL vide letter No. 1(33) GP-I/2021 dated 31st December 2021 [**Annex-A**] to obtain a separate generation license for the 747MW CCPP, and consequently, to also file a petition for modification of CPGCL’s existing license to exclude this plant from CPGCL’s existing Generation License.

5. Thus, through this petition, CPGCL prays for the grant of a generation license for the 747MW CCPP, Guddu. CPGCL is, at the same time, has already filed a separate license proposed modification to its Generation License No. GL/02/2002 for the exclusion of the 747MW CCPP from its existing license on 30th December 2022.
6. Furthermore, in view of the fact that although the useful life of the 747MW CCPP is 30 years from date of commissioning (i.e., 17th December 2014), whereas its existing license is valid only until the year 2042, CPGCL prays for the grant of the generation license for the 747MW CCPP until 16th December 2044.
7. In addition to the aforementioned, CPGCL prays for the allocation of block-wise auxiliary consumption for the whole of the 747MW CCPP instead of unit-wise allocation of auxiliary consumption, as contained in Schedule II of CPGCL's existing Generation License. This is on account of the fact that this plant was not designed to have a separate auxiliary system for its steam turbine (ST-16), in order to save capital expenditure on the project and to reduce its capacity purchase price. Accordingly, the auxiliary consumption between the plant's steam turbine (ST-16) and its two gas turbines (GT-15 and GT-15) cannot be segregated.
8. **CPGCL certifies and undertakes that its quality of service and performance under the existing Generation License shall not be affected on account of acceptance of this petition by the Authority. It is furthermore certified that this petition does not contravene any of the terms of the Power Purchase Agreement.**

C. Prayer

9. In view of the foregoing, it is prayed that the Authority may graciously:
 - (i) Grant a generation license for the 747MW CCPP, Guddu until 16th December 2044;
 - (ii) Allocate block-wise auxiliary consumption for the whole plant, instead of unit-wise allocation for the two gas turbines and one steam turbine of the plant; *and*
 - (iii) Grant any other better relief deemed appropriate in the circumstances.

CPGCL – Petition for Grant of Separate Generation License for the 747MW CCPP Guddu

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Islamabad, March 2023

for the Petitioner

Sabeeh uz Zaman

Engr. Sabeeh Uz Zaman Faruqi
Chief Executive Officer / Authorized Representative.

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ANNEX-A

**POWER DIVISION'S LETTER NO. 1(33)GP-I/2021
DATED 31 DECEMBER 2012**

A

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Government of Pakistan
Ministry of Energy
(Power Division)

- 8 -

No. 1(33) GP-I/2021

Islamabad, 31st December 2021

Subject: PRIVATIZATION OF GUDDU POWER PLANT AND NANDIPUR POWER PLANT

I am directed to refer to the subject noted above and to inform that the Cabinet Committee on Privatization (CCOP) while considering the summary of Privatization Commission during its meeting held on 31.12.2021, inter alia, directed Power Division, that under:

	Issues	Direction by the CCOP
I.	Removal of charge created on GPP & NPP assets for Sukuk Bond issued by Govt	GHCL may clarify whether the GENCO-II and GENCO-III have alternate assets to offer, after ascertaining the exact nature of charge on the assets of GPP & NPP.
II.	Separate corporate entities to be established each for GPP & NPP, carving out from CPGCL & NPGCL respectively.	GHCL to initiate requisite actions, to be completed within 1 month.
III.	Separate Power Purchase Agreement (PPA) to be entered into for GPP & NPP with CPPA	
IV.	Implementation Agreement to be signed for GPP and NPP	
V.	Separate Gas Allocation to be made specific to GPP and NPP	
VI.	Separate GSPA to be signed for GPP and NPP (post gas allocation).	
VII.	Separate Gas header to be created for GPP and NPP	
VIII.	Separate power generation license to be applied to NEPRA, carving out GPP and NPP from consolidated license of CPGCL (GENCO-II) and NPGCL (GENCO-III) respectively	
IX.	Transfer of Land and assets of both these Plants in the name of new GPP company and NPP Company to be established	

2. In view of aforesaid, GHCL is directed to implement the directions of the CCOP and provide the requisite information/implementation report to this Division on weekly basis at soenergy@mra.gov.pk

The Chief Executive Officer,
GHCL,
Islamabad

- PS to Secretary Ministry of Energy (Power Division), Islamabad.
- PS to Additional Secretary (I), Ministry of Energy (Power Division)

(Muhammad Naveem)
Section Officer (Gen)
051-8203213

Important

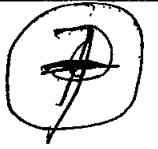
① CEO CPGCL
② CEO NPGCL
Jawid / a
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ANNEX-B

PROSPECTUS

B



CENTRAL POWER GENERATION
COMPANY LIMITED
(CPGCL)



PROJECTUS

INTRODUCTION



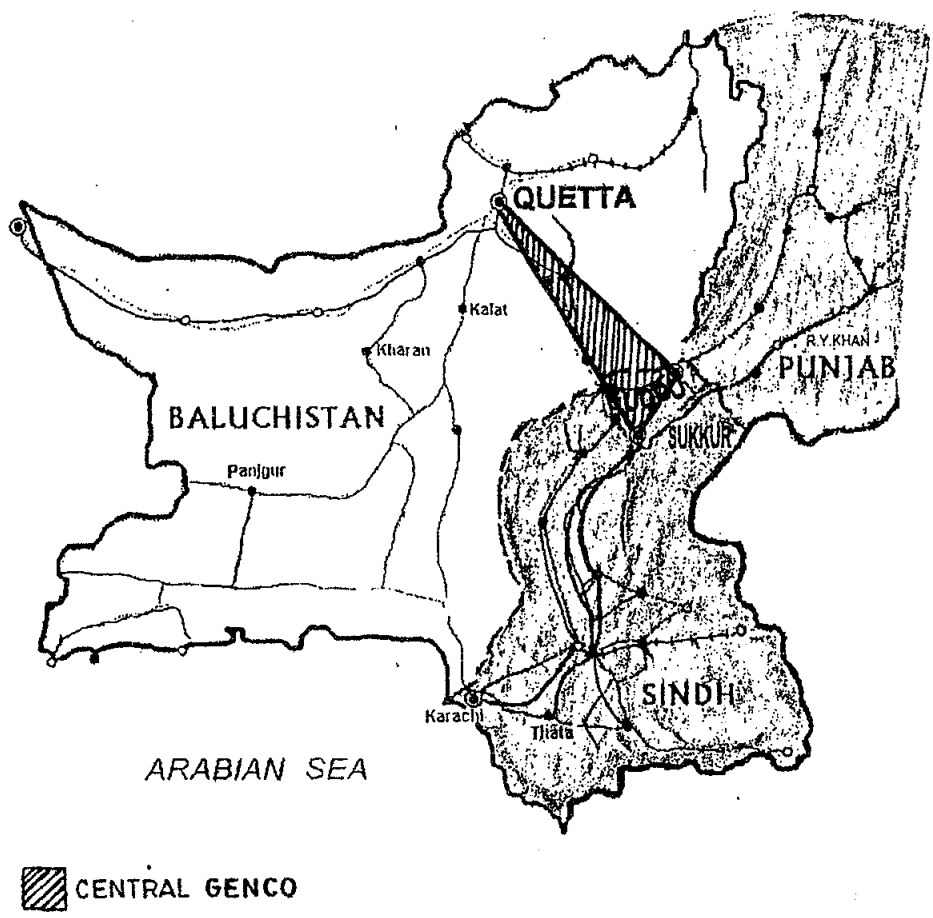
In 1963, WAPDA carried out a Power market survey to prepare an integrated plan for 10-year development. It established the need for construction of a big Thermal Power Station (800-1000 MW) in Upper Sindh. Many sites were considered. Guddu, one of the most under-developed parts in the mid country flanked by Sui and Mari Gas fields, was found to be ideally situated on the junction of Sindh, Baluchistan and Punjab. Presence of Guddu Barrage with an additional facility of 1200 built-in residences vacated by irrigation Department on completion of Guddu Barrage made it a logical choice for construction of the proposed Power Station which was finally selected by the planners.

Guddu, the largest Thermal Power Generation Complex of Pakistan, is situated on the right bank of River Indus near Guddu Barrage, 10 Km from Kashmore in District Jacobabad (Sindh). It is about 60 Km away from Sadiqabad and about 160 Km from Sukkur. Guddu has Air Link with Karachi and Lahore. The nearest airport is Rahim Yar Khan at 85 Km. The nearest available Rail Link is at Kashmore besides Sadiqabad and Daharki Railway Stations on main line, each 60 Km from Guddu.

Guddu is connected with rest of the Country both by Road and Railways. The mobile networks, wireless, telex, fax and telephonic facilities have connected Guddu with rest of the world. A small metal led air-strip is also available for operation of small aircrafts for emergencies / VIP visitors.

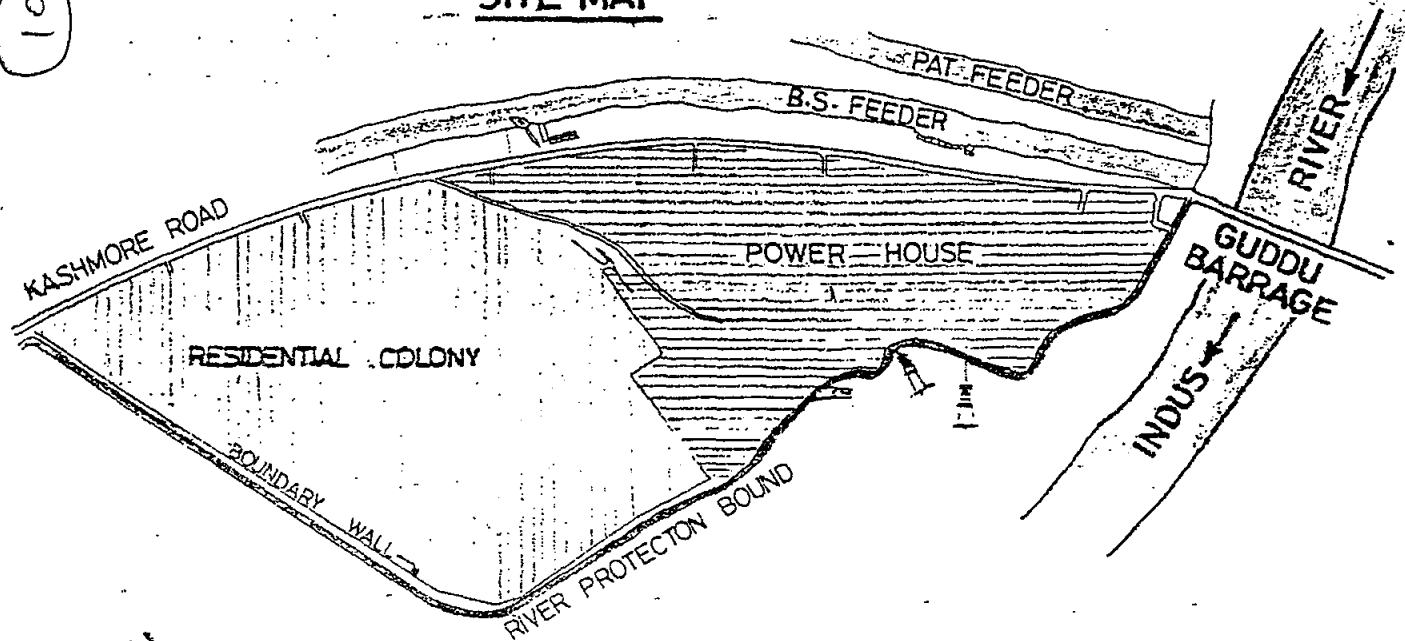
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LOCATION MAP



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SITE MAP



COLONY AREA	= 454 ACRES
POWER HOUSE AREA	= 250 ACRES
GROUND LEVEL AT COLONY	= 250' TO 252'
GROUND LEVEL AT POWER HOUSE	= 263'
ELEVATION OF RIVER PROTECTION BOUND	= 264'
WORST FLOOD LEVEL IN 1976-77 U/S	= 259.3'
WORST FLOOD LEVEL IN 1976-77 D/S	= 258.4'
BARRAGE ROAD LEVEL	= 271.16'

TYPE, SIZE & MAKE OF UNITS

(11)

Unit No.	Capacity (MW)	Type	Make	Date of Commissioning
14	243	G.T	GE, USA	17.12.2014
15	243	G.T	GE, USA	
16	261	C.C (Steam)	Harbin Turbine Company, China	

Cost Abstract

Phase	Units	Capacity & Type	Project Cost Rs. in Millions	Credits	EPC CONTRACTOR
V	GT-14 GT-15 ST-16	747MW (2x243 MW Gas Turbine 261 MW Steam Turbine)	79,000	Exim Bank of China & GoP	Harbin Electric International, China

TRANSMISSION LINES

(12)

Sr. No.	Voltage (kV)	Circuit
01.	500	Muzaffargarh-II
02.	500	Rahim Yar Khan
03.	500	Old Guddu

FUEL

(NATURAL GAS & HSD OIL)

The Electric Power is generated using Gas from Kandh Kot through two 16" dia, 56 km gas pipelines and High-Speed Diesel (HSD). Gas supply is made through Gas Mixing station which is located inside the Block-II of TPS guddu. The average daily gas consumption at present is **140 to 156 MMCFD**, which is supplied through gas pipelines as per following quota:

Kandh Kot -I&III = 200 MMCFD

Facility for generation on HSD oil is also available; in this regard 9 Nos. HSD Oil Tanks are installed having total storage capacity of 50,000 M. Tons of HSD. The HSD Oil is received through Tank lorries by road from Karachi and decanted at Fuel Oil Station and then shifted to Fuel Oil Tanks.

COOLING WATER SOURCES

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Primary Source(Open Cycle) :

Canal Water is supplied from Begari Sind (B.S) Feeder emanating from Right Bank of River Indus at Guddu Barrage.

Secondary Source (Closed Cycle) :

During the closure of B.S Feeder, water supply is taken from Tube Wells and Floating Pump House from Guddu Barrage.

Requirement of Water:

747 MW Combined cycle 350 Cusecs

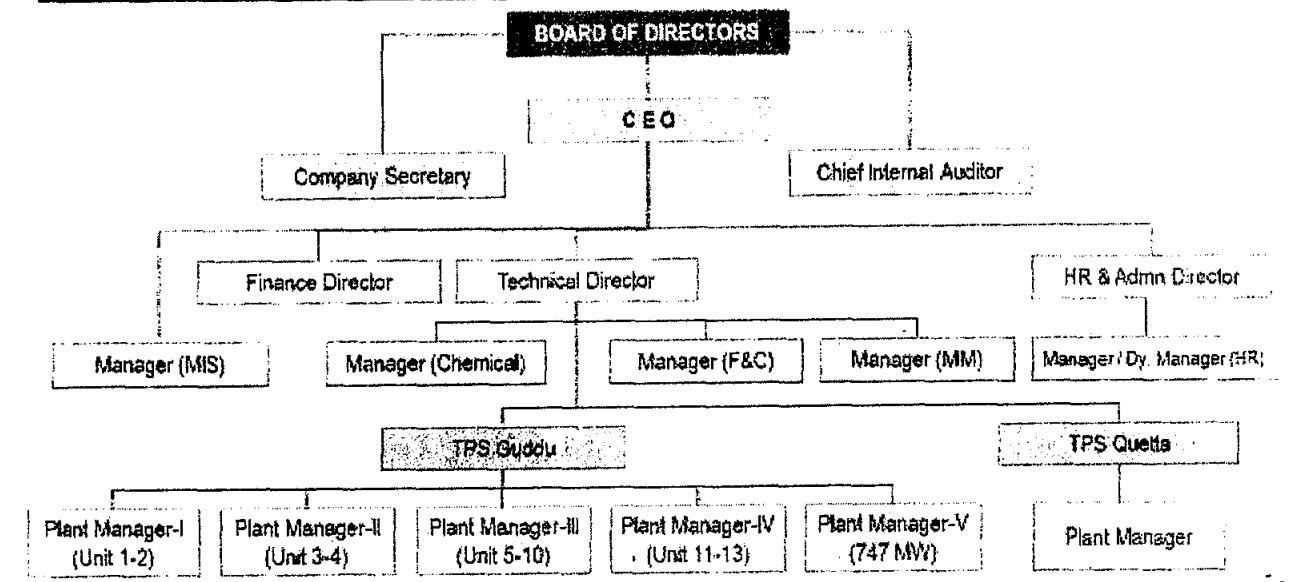
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PLANT OPERATING DATA UPTO 31.12.2022

UNIT NO.	DATE OF COMMISSIONING	RUNNING HOURS	GENERATION (M.KWH)
14	17.12.2014	46,846	9,378
15		61,272	12,556
16		53,003	8,893
TOTAL			30,827

HUMAN RESOURCE MANAGEMENT

COMPANY ORGANOGRAM



-----The end-----

PLANT CHARACTERISTICS

1	Generation Voltage	2 x Gas Turbines	1 x Steam Turbine	
		15kV	20kV	
2	Frequency	50Hz		
3	Power Factor	0.85		
4	Automation Generation Control	Yes		
5	Gas Turbine Efficiency	32.96% on Gas (HHV)		
6	Combined Cycle Efficiency	49.19% on Gas (HHV) 45.82% on HSD		
7	Auxiliary Consumption	26.21 MW		
8	Ramping Rate (MW/min)	2 x Gas Turbines	1 x Steam Turbine	
		17.357	1.891	
9	Time required to synchronize to Grid and loading the machines at full load (Minutes)	Start-up mode	Gas Turbine (Simple Cycle)	Steam Turbine
		Hot Start Less than 10 Hours	60	100
		Warm Start More than 10 hours and less than 72 Hours	-	360
		Cold Start More than 72 Hours	-	660
10	Schedule Outages			
		RECOMMENDED HOURS		DURATION
		Quarterly or after every 2000 FFH, whichever earlier		20 days / Year
Air Inter Filter Replacement		Annual		05 days
Hot Gas Path Inspection (HGPI)		After 32,000 EOH		30 days
		After 64,000 EOH		35 days
ACTIVITY		RECOMMENDED HOURS		DURATION
Condenser & Cooling Tower Cleaning		Annual		30 days
		After 50,000 EOH		60 days
ACTIVITY		RECOMMENDED HOURS		DURATION
HRSG Inspection		Annual		10 days

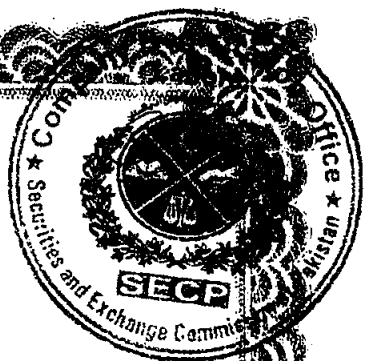
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ANNEX-C

CERTIFICATE OF INCORPORATION

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GOVERNMENT OF PAKISTAN



CERTIFICATE OF INCORPORATION

(Under section 32 of the Companies Ordinance, 1984 (XLVII of 1984))

Company Registration No. L 09677 of 1998-99

I hereby certify that "CENTRAL POWER GENERATION COMPANY LTD."

// //

// //

is this day incorporated under the Companies Ordinance, 1984 (XLVII of 1984) and that

the company is limited by shares.

Given under my hand at Lahore.

this 26th day of October

one thousand nine hundred and ninety eight.

Fee Rs. 2,000/-

CERTIFIED TO BE TRUE COPY
[Signature]
JOINT REGISTRAR OF COMPANIES
COMPANY REGISTRATION OFFICE
LAHORE

CRO-1

[Signature]
AKBAR SHAR)
JOINT REGISTRAR
OF COMPANIES

No - JRL/3011 dt 26/10/98

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ANNEX-D

MEMORANDUM AND ARTICLE OF ASSOCIATION

(6)

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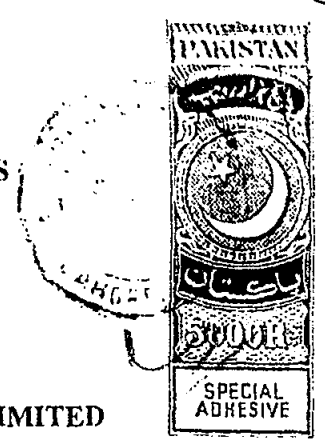
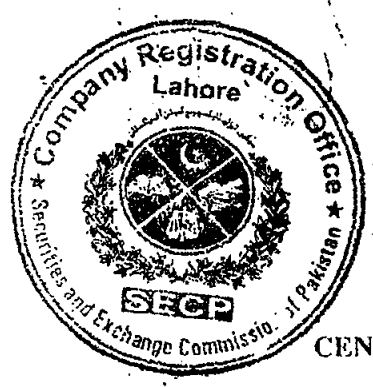
THE COMPANIES ORDINANCE 1984

PUBLIC COMPANY LIMITED BY SHARES

MEMORANDUM OF ASSOCIATION

-of-

CENTRAL POWER GENERATION COMPANY LIMITED

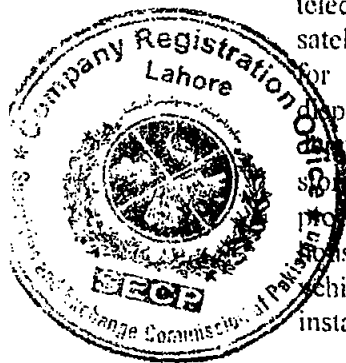


- I. The name of the Company is "Central Power Generation Company Limited".
- II. The registered office of the Company will be situated in the Province of Punjab, Pakistan.
- III. The objects for which the Company is established are to undertake any or all of the following businesses in and outside Pakistan:
 1. Guddu, Sukkur and Quetta Power Facilities:- To acquire or purchase from the Pakistan Water and Power Development Authority ("WAPDA") the business, properties, assets, and undertakings of WAPDA's blended fuel oil, high speed diesel, natural gas, coal fired and combined cycle power stations, having a combined nominal generation capacity of 1799.35 MW, consisting of twenty three (23) thermal power generation units, situated in the Districts of Jacobabad and Sukkur located in Province of Sind and Quetta, in the Province of Baluchistan, together with related facilities (collectively, the "Facilities") and to take over any or all of the belongings, funds, assets, rights, privileges, liabilities, obligations and contracts related to or in respect of the Facilities.
 2. Power Generation. - To carry on the businesses of generating, purchasing, importing, transforming, converting, distributing, supplying, exporting and dealing in electricity and all other forms of energy and products or services associated therewith and of promoting the conservation and efficient use of electricity and all other forms of energy, and all other powers necessary or incidental to the business of electricity generation, transmission, distribution and supply.
 3. Electrification. - To do anything which a public electricity generation licensee is empowered or required to do under or by virtue of or under a license or other authorization granted according to law and its implementing rules and regulations or any statutory instrument made thereunder or any statutory modification or re-enactment thereof and to plan, survey, design, supply equipment, and carry out the electrification of cities, towns, villages, gas and oil refineries, workshops, buildings, highways, bridges, ports, air terminals, and other premises within or outside Pakistan.
 4. Dealer in Electrical Equipment. - To carry on all or any of the businesses of wholesalers, retailers, traders, importers, exporters, suppliers, distributors, designers, developers, manufacturers, installers, fitters, testers, repairers, maintainers, contractors, constructors, operators, users, inspectors, reconditioners.

servicers, improvers, alterers, protectors, removers, hirers, replacers, importers and exporters of, and dealers in, electrical appliances, systems products and services used for energy conservation, domestic, commercial, agricultural, industrial, household and general equipment, furniture, fixtures, fittings and devices, and all other kinds of goods, equipment, machinery, materials and installations, including but not limited to cables, wires, meters, pylons, tracks, rails, pipelines and any other plant, apparatus, equipment, systems and things incidental to the efficient generation, procurement, transformation, supply, and distribution of electricity.

5. Determination of Bulk Supply Tariff Rates. - To ascertain the bulk supply tariff rates that will secure recovery of operating costs, interest charges and depreciation of assets, redemption at due time of loans other than those covered by depreciation, expansion projects, payment of taxes, and a reasonable return on investment, and to petition the appropriate government body for the adoption or increase in its schedule of bulk supply tariff rates.

6. Facilities and Installations. - To locate, establish, construct, equip, operate, use, manage and maintain thermal power plants, power grid stations, transforming, switching, conversion, and distribution facilities, grid stations, cables, overhead lines, substations, switching stations, tunnels, cable bridges, link boxes, telecommunications stations, masts, aerials and dishes, fiber optic circuits, satellites and satellite microwave connections, heat pumps, plant and equipment for combined heat and power schemes, offices, computer centers, shops, dispensing machines for pre-payment cards and other devices, showrooms, depots, factories, workshops, plants, printing facilities, warehouses and other storage facilities (including but not limited to facilities for storage and disposal of products and waste), training, education and display centers, stands and showrooms, testing premises, laboratories, research stations, compressor stations, vehicle parks, terminals, transport facilities, roads, and other electrical installations and infrastructure it may deem beneficial to its business.



7. Acquisition and Conveyance of Assets. - To acquire or convey, whether by purchase, lease, concession, grant, hire or otherwise, establish, develop, exploit, operate and maintain real or personal properties including but not limited to any estates in land, claims, licenses, concessions, easements, exploration and production rights, and rights or interests of all descriptions in or relating to the same, which may seem to the Company capable or possibly capable of affording or facilitating the generation purchase, transformation, conversion, supply, distribution, and development of electricity or any other form of energy, and for the accomplishment of all the purposes of the Company herein stated.

8. Site Development. - To build, construct, maintain, alter, enlarge, pull down, and remove or replace structures, factories, offices, works, wharves, roads, railways, tramways, machinery, engines, walls, fences, banks, dams, sluices or water courses and to clear sites for the same and to work, manage and control the same and to carry on any other business which may seem to the Company capable of being conveniently carried on in connection with the above or calculated directly or indirectly to enhance the value of or render more profitable the Company's properties, but not to engage in the business of a real estate developer.

(8)

(20)

9. Intellectual Property Rights. - To apply for and take out, purchase or otherwise acquire any patents, patent rights, inventions, secret processes, designs, copyrights, trademarks, service marks, commercial names and designations, technological know-how, formulae, licenses, concessions and the like (and any interest in any of them), and exclusive or non-exclusive or limited rights to use any secret or other information as to any invention or secret process of any kind, and to use, exercise, develop, and grant licenses in respect of, and otherwise turn to account and deal with, the property, rights and information so acquired.

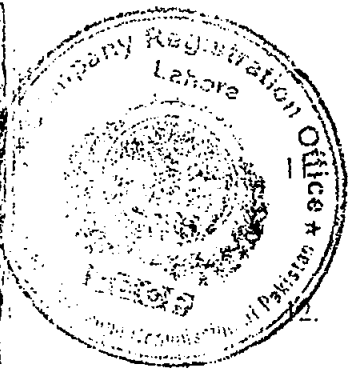
10. Metering. - For the purposes of electricity generation and supply, distribution and communication, to install in, on, above or under any premises or place and to operate, use, inspect, maintain, repair, replace and remove cables, lines, ducts, transformers, switchgear (remotely controlled and otherwise, and including time switches), fuses, circuit breakers, electricity service equipment, meters and other devices for measuring or controlling the quantity or quality of electricity supplied, prepayment and debt payment devices, items provided to afford access to, support, encase, insulate, and protect from damage or tampering, the above-mentioned gadgets, or to protect people and property from injury or damage, or to comply with any legal obligation and for other purposes associated with the generation and supply of electricity and to install all such things and apparatus and items for the purposes of generating, supplying, measuring and controlling light, heat, steam, hot water, air-conditioning and refrigeration, and for associated purposes, including payment for these facilities.

Demand Forecasting. - To provide or procure the provision of such facilities and services as may be necessary or desirable to forecast electricity/energy demand and to satisfy such demand.

Transportation. - To acquire, (whether by purchase, lease, concession, grant, hire or otherwise), charter, lease, take or let on hire, operate, use, employ or turn to account, build, equip, service, repair, maintain, and supply motor vehicles, railway locomotives, wagons, trucks, vessels, and craft of any description, engineering plants and machinery, and parts and accessories of all kinds, and to carry on the businesses of storage contractors, freight contractors, carriers by land, water and air, of freight and passengers, forwarding agents, shipping agents and agents of any other kind, in so far as such activities are incidental to or necessary for the generation, transformation, supply and distribution of electricity.

13. Audio-Visual System. - To carry on as principal, agent, contractor or sub-contractor all or any of the businesses of running, operating, managing, supplying and dealing in systems for the conveyance by any means of sounds, visual images, signals, and services, facilities and equipment ancillary to or for use in connection with such systems.

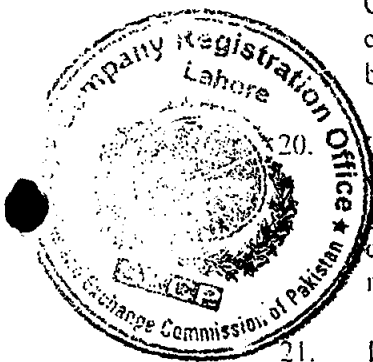
14. Management Information System. - To carry on all or any of the businesses of running, operating, managing, supplying and dealing in data processing and information retrieval systems, computers, computer programmes and software, computer bureau and data bases, meter reading and credit checking and to provide services, facilities and equipment ancillary to or for use in connection with the same.



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15. Research and Development. - To carry on business as inventors, researchers and developers, to conduct, promote and commission research and development in connection with the businesses and activities of the Company and its subsidiaries, to establish and maintain research stations, laboratories, workshops, testing and proving grounds and sites, facilities and establishments and installations, and to exploit and turn to account the results of any research and development carried out by or for it.
16. Labour Contracting. - To carry on all or any of the businesses of consultants, advisers and suppliers of management, personnel and training services, whether generally or in respect of one or more of the types of business or activity which the Company has power to carry on, and to provide training and educational courses, instruction and materials, of every description for workers of the Company and for other persons.
17. Contracts. - To enter into agreement with any individual, firm, cooperative or other society, company, corporate body, Government or local authority or other legal entity necessary or expedient for the purpose of carrying on any business of the Company.
18. Engineering Services. - To carry on all or any of the businesses of and provide services associated with engineers (including without limitation electrical, mechanical, heating, ventilation, civil, chemical, sanitation, telecommunications and gas engineers), mechanics, technicians, draftsmen, designers, surveyors, architects, builders, installers, and shopfitters.
19. Advertisement. - To adopt such means of making known the products of the Company as may seem expedient and, in particular, by advertising in the press, by circulars, by purchase and exhibition of works of art or interests, by publication of books and periodicals, and by granting prizes, rewards and donations.
20. Other Businesses. - To carry on all or any of the businesses of manufacturers, wholesalers, retailers, and traders, whether generally or in relation to particular goods or commodities, and to carry on all or any of the businesses of factors, debt collectors, and developers of and dealers in property, so far as incidental necessary for the generation, transformation, distribution and supply of electricity.
21. Borrowing. - To borrow or raise money or secure or discharge any debt or obligation (whether of the Company or any other person) in such manner as the Company thinks fit and in particular (but without prejudice to the generality of the foregoing) by the creation or issue, upon such terms as to priority or otherwise as the Company thinks fit, of securities of any kind or mortgages or discharges founded or based upon all or any part of the undertaking, property, assets and rights (present and future) of the Company, or, without any such security, and advance payments with or without allowance of mark-up thereon.
22. Bank Accounts. - To open, operate, transfer, and close banking accounts of the Company with any bank or banks and to draw, make, accept, endorse, discount, execute, and issue promissory notes, bills of exchange, bills of lading, warrants, debentures, and other negotiable/non-negotiable or transferable/non-transferable instruments, but not to act as a finance or banking company.

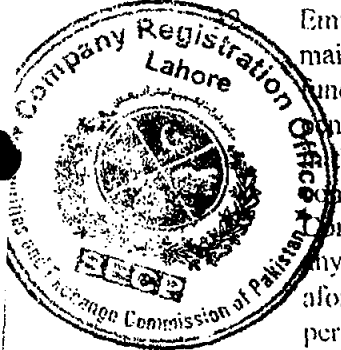


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23. Guaranty and Suretyship. - To enter into any guarantee, contract of indemnity or suretyship and, in particular (without prejudice to the generality of the foregoing), to guarantee, support or secure, with or without consideration, whether by personal obligation or by mortgaging or charging all or any part of the undertaking, property and assets (present and future), and unsubscribed capital of the Company or by both such methods or in any other manner, the performance of any contract, obligation or commitment of, and the repayment or payment of the principal amounts of and any premiums, interest, dividends, and other moneys payable on or in respect of any securities or liabilities of, any person, including (without prejudice to the generality of the foregoing) any company which is a subsidiary, an affiliate or a holding company of the Company or otherwise associated with the Company, whether or not any valuable consideration or advantage is received by the Company.
24. Partnerships. - To enter into partnership, joint venture or cooperation arrangements with any person or company or other legal entity, local or foreign, carrying on or engaged in any business or transaction which the Company is authorized to carry on or engage in, or otherwise seek assistance from or assist any such person, company or legal entity.
25. Related Businesses. - To acquire by any means the whole or any part of the assets, and to undertake the whole or any part of the liabilities, of any person, natural or juridical, carrying on or proposing to carry on any business which the Company is authorized to carry on or which can be carried on in connection therewith, to acquire an interest in, amalgamate or enter into partnership or into any arrangement for sharing profits, cooperation, or mutual assistance, with any such person, to promote, form and sponsor any company or companies in furtherance of the objects herein stated, and to give or accept, for any of the acts or things aforesaid or property acquired, such consideration as the Company thinks fit, including without limitation, any shares, debentures, or other securities or rights.
26. Equity Investment. - To invest the surplus moneys of the Company not immediately required in any manner to subscribe for, purchase or otherwise acquire, and to hold, and deal with, any shares, debentures, bonds, notes, and other securities, obligations and investments of any nature whatsoever, including any options or rights in respect of them, and otherwise to invest and deal with the money and assets of the Company, but not to act as an investment company.
27. Lending. - To advance money or give credit to such persons or companies and on such terms as may seem expedient and, in particular, to customers and others having dealings with the Company, to guarantee the performance of any contract or obligation and the payment of money by the Company, and to accept securities of any person or any property or interest therein of whatever nature in payment or partial payment for any services rendered or for any sale or supply made to, or debt owing from, any such person, but not to act as a finance or banking company.
28. Trusts. - To vest any real or personal property, rights or interests acquired by or belonging to the Company in any person or company on behalf of or for the benefit of the Company, with or without any declared trust in favour of the Company, and to undertake and execute any trust the undertaking whereof may seem desirable, either gratuitously or otherwise.



- 29. Portfolio Investments. - Subject to such terms and conditions as may be thought advantageous, to trade its shares and to undertake markup and currency swaps, options (including traded options), swap option contracts, forward exchange contracts, futures contracts or other financial instruments allowed by law, including hedging agreements of any kind, all or any of which may be on a fixed and/or floating rate basis and/or in respect of local or foreign currency or commodities of any kind, but not to engage in the business of a stockbroker.
- 30. Government Permissions. - To apply for and obtain necessary consents, permissions and licenses from any Government, Provincial, Local, Foreign, Multilateral or other authorities or entities for enabling the Company to carry any of its objects into affect or for extending any of the powers of the Company or for effecting any modification of the constitution of the Company or for any other purpose which may seem expedient, and to enter into arrangements with any Government or authorities, foreign, federal, provincial, municipal, local or otherwise, public or quasi-public bodies, or with any other persons, in any place where the Company may have interests that may seem conducive to the objects of the Company or any of them and to obtain from any such Government, authorities or persons any rights, privileges and concessions which the Company may think fit to obtain, and to carry out, exercise and comply therewith.
- 31. Dispute Resolution. - To resolve disputes by negotiation, conciliation, mediation, arbitration, litigation or other means, judicial or extra-judicial, and to enter into compromise agreement with creditors, members and any other persons in respect of any difference or dispute with them and to exercise the power to sue and be sued and to initiate or oppose all actions, steps, proceedings or applications which may seem calculated directly or indirectly to benefit or prejudice, as the case may be, the interests of the Company or of its members.



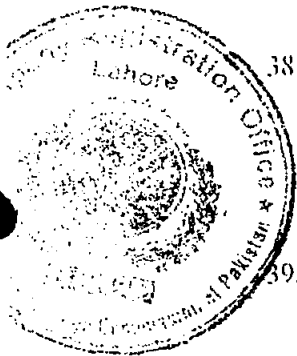
Employees' Funds. - To establish and maintain or procure the establishment and maintenance of any contributory or non-contributory pension or superannuation funds for the benefit of, and give or procure the giving of donations, gratuities, pensions, allowances or emoluments to such persons who are or were at any time in the employ or service of the Company, or of any company which is a holding company or a subsidiary of the Company or is allied to or associated with the Company or with any such subsidiary or affiliate company, or who are or were at any time directors or officers of the Company or of any such other company as aforesaid, and the wives, widows, families and qualified dependents of any such persons, and also to establish, subsidize and subscribe to institutions, associations, clubs or funds calculated to be for the benefit of or to advance the interests and well-being of the Company or of any such other company as aforesaid, and make payments to or towards the insurance of any such person as aforesaid and do any of the matters aforesaid, either alone or in conjunction with any such other company as aforesaid.

- 33. Remuneration. - To enter into contracts with its salaried employees, including a chief executive who, prior to his appointment as such, was not a director of the Company or of its subsidiary or holding Company, and to provide for such other financial assistance to said employees or workers under personnel rules and regulations that the Company may subsequently adopt.

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34. Commissions. - To pay and discharge all or any expenses, costs and disbursements, and to pay commissions and to remunerate any person for services rendered or to be rendered in connection with the formation, registration, promotion and flotation of the Company and any company formed, sponsored, registered, and promoted by the Company or incidental to any negotiations between promoters preliminary to the formation of the Company, and the underwriting, placing or issue at any time of securities of the Company or of any other person plus all costs and expenses incurred in the acquisition of any property or assets, including the accomplishment of all or any formalities which the Company may think necessary or proper in connection with any of the matters aforesaid.
35. Charitable Contributions. - To subscribe or contribute (in cash or in kind) surplus properties to, and to promote or sponsor, any charitable, eleemosynary, scientific, educational, benevolent or useful object of a public character or any object which may in the opinion of the Company be likely, directly or indirectly, to further the interests of the Company, its employees and workers or its members, and to receive donations and grants, in cash or in kind, whether absolutely gratuitous or otherwise, which it may deem beneficial to its business, employees or shareholders.
36. Dissolution and Winding Up. - To cease carrying on or wind up any business or activity of the Company and to cancel any registration of and to wind up or procure the dissolution of the Company in any state or territory.
37. Equity Conversion. - To issue, allot and grant options over securities of the Company towards the satisfaction of any liability or obligation undertaken or agreed to be undertaken by or for the benefit of the Company, or in consideration of any obligation or for any other similar purpose.
38. International Operations. - To procure the Company to be registered or recognized in any part of the world and to do all or any of the above things in any part of the world, either as principal, agent, trustee, contractor or otherwise, alone or in collaboration with another, and either by or through agents, trustees, sub-contractors, subsidiaries or otherwise.
39. Disposal of Assets and Declaration of Dividends. - To dispose by any means of the whole or any part of the assets of the Company or of any interest therein and to distribute in specie or otherwise by way of dividends or bonus or reduction of capital all or any of the property or assets of the Company among its members, and particularly, but without prejudice to the generality of the foregoing, securities of any other company formed to take over the whole or any part of the assets or liabilities of the Company or any proceeds of sale or other disposal of any property or assets of the Company.
40. Insurance. - To insure the property, assets, and employees of the Company in any manner deemed fit by the Company, and to create any reserve fund, sinking fund, insurance fund or any other special fund whether for depreciation or for repairing, insuring, improving, extending or maintaining any of the properties of the Company or for any other purpose conducive to the interests of the Company, but not to act as an insurance company.



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- 41. Regulations. - To make rules or regulations not inconsistent with this Memorandum and to provide for all matters for which provision is necessary or expedient for the purpose of giving effect to the provisions of this Memorandum and the efficient conduct of the affairs of the Company.
- 42. General Power. - To carry on any other businesses or activities which the Directors consider capable of being carried on directly or indirectly for the benefit of the Company and to do all such other things as may be deemed incidental or conducive to the attainment of the above objects or any of them.

Declaration. It is hereby declared that:

- (a) the word "company" in this Memorandum of Association, except where used in reference to this Company, shall be deemed to include any partnership or other body of persons, whether corporate or unincorporated, and whether domiciled in Pakistan or elsewhere;
- (b) the objects specified in each of the paragraphs of this clause shall be regarded as independent objects and, accordingly, shall in no way be limited or restricted (except where otherwise expressed in such paragraphs) by reference to or inference from the terms of any other paragraph or the name of the Company, but may be carried out in as full and ample a manner and construed in as wide a sense as if each of the said paragraphs defined the objects of a separate and distinct company;



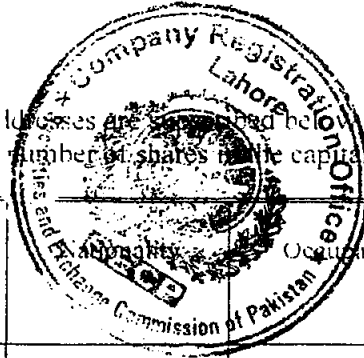
- (c) the headings used in each of the paragraphs of this clause are for convenience only and are not intended to affect the construction thereof in any way; and,

notwithstanding anything contained in the foregoing object clauses of this Memorandum of Association, nothing herein shall be construed as empowering the Company to undertake or indulge in the business of banking or financing institution, leasing, investment, or real estate brokerage or insurance, directly or indirectly, as restricted by law or any unlawful operations.

- IV. The liability of the members is limited.
- V. The authorized share capital of the Company shall be Rs. 50,000,000,000 (Rupees Fifty billion) divided into 5,000,000,000 (five billion) ordinary shares of Rs. 10 (Rupees Ten) each with power to increase or reduce the capital and to divide the shares in the capital for the time being into several classes and to attach thereto respectively such rights, privileges or conditions as may be determined by or in accordance with the regulations of the Company. and to vary, modify or abrogate any such rights, privileges or conditions in such manner as may for the time being be provided by the regulations of the Company in accordance with law; provided, however, that rights as between various classes of ordinary shares, if any, as to profits, votes and other benefits shall be strictly proportionate to the paid-up value of shares.

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0	(Pre)	1.N	2.C	3.N	4.N	5.N	6.N	7.C	D	W
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We, the several persons whose names and addresses are mentioned hereunder are desirous of being formed in 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 to our respective names.

Name and surname (Present and former) in full (in Block Letters)	Father's / Husband's Name in Full	Occupation	Residential Address in Full	Number of Shares taken by each Subscriber	Signature
1. Mr. Abdul Waris Khan	Abdul Wajid	Pakistani	Wapda Service A-1, Wapda Colony, TPS, Muzaffargarh	1	<i>Abdul Waris</i>
2. Ch. Abdul Ghafoor	Ch. Shah Muhammad	Pakistani	Wapda Service 688-Canal View, Lahore.	1	<i>Abdul Ghafoor</i>
3. Mr. Muhammad Ahmad	Mehboob Ahmad	Pakistani	Wapda Service 10-Pak Block, Allama Iqbal Town, Lahore.	1	<i>Muhammad Ahmad</i>
4. Mr. Javed Nizam	Muhammad Islam	Pakistani	Wapda Service 263-Tariq Block, Allama Iqbal Town, Lahore.	1	<i>Javed Nizam</i>
5. Mr. Nawaz Ali Samejo	Abdul Rahim	Pakistani	Wapda Service K-13, Wapda Colony, TPS, Guddu, Kashmir Distt. Jacobabad.	1	<i>Nawaz Ali Samejo</i>
6. Mr. Inayat Ullah	Saif Ullah Khan	Pakistani	Wapda Service Bungalow No.34-B, Wapda Officer's Colony, Upper Mall, Lahore.	1	<i>Inayat Ullah</i>
7. Ch. Mushtaq Ahmed	Ch. Jan Muhammad	Pakistani	Wapda Service 15-E, Model Town, Lahore:	1	<i>Mushtaq Ahmed</i>

Total number of shares taken 7 (Seven)

Dated the 19 day of October, 1998

Witness to the above signatures

(Full Name, Father's/Husband's Name)

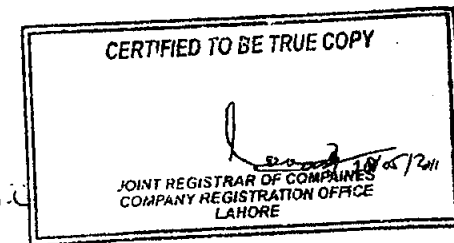
(in Block Letters) MUHAMMAD - JAMIL

S/O Muhammad Saif

Signature *M. Jamil*

Occupation Service

Full Address 185-B, Block of Revenue Society Lahore



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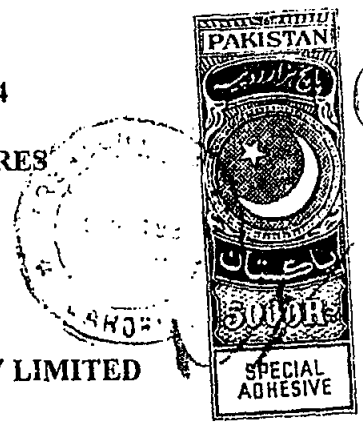
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THE COMPANIES ORDINANCE 1984
PUBLIC COMPANY LIMITED BY SHARES
ARTICLES OF ASSOCIATION

-of-

CENTRAL POWER GENERATION COMPANY LIMITED



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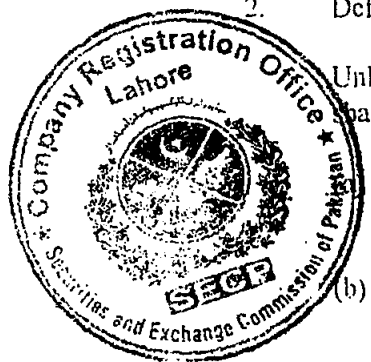
I. PRELIMINARY

1. TABLE "A" Not to Apply

The regulations in Table 'A' in the First Schedule to the Companies Ordinance, 1984 shall not apply to the Company except as reproduced herein.

2. Definitions

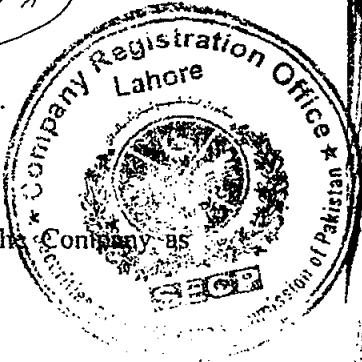
Unless the context otherwise requires, capitalized terms used in these Articles shall have the meanings set out below:-



- (a) "Articles" mean these Articles as originally framed or as from time to time altered in accordance with law.
- (b) "Board" means the group of Directors in a meeting duly called and constituted or, as the case may be, the Directors assembled at a board.
- (c) "Company" means the Central Power Generation Company Limited.
- (d) "Directors" means the Directors for the time being of the Company as named in Article 49 and, subsequently, such members duly elected and registered pursuant to Sections 178 and 205, respectively.
- (e) "Month" means calendar month according to the Gregorian calendar.
- (f) "Office" means the registered office for the time being of the Company.
- (g) "Ordinance" means the Companies Ordinance, 1984, or any modification or re-enactment thereof for the time being in force.
- (h) "Ordinary Resolution" means a resolution passed at a general meeting of the Company when the votes cast (whether *viva voce*, by show of hands or by poll) in favour of a resolution by members who, being entitled to vote in person or by proxy, do so vote, exceed the number of votes, if any, cast against the resolution by members so entitled and voting.
- (i) "Register" means, unless the context otherwise requires, the register of members to be kept pursuant to Section 147 of the Ordinance.

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- (j) "Seal" means the common or official seal of the Company.
- (k) "Section" means a Section of the Ordinance.
- (l) "Special Resolution" means the special resolution of the Company as defined in Section 2(1)(36) of the Ordinance.

3. Interpretation

In these Articles, unless the context otherwise requires:-

- (a) provisions bearing on transfer or transmission of shares, meetings, voting in person or by proxy, management, and the appointment, powers and removal of Directors and employees of the Company shall be read subject to the provisions of Section 183 relating to the power of control by a holding company over its subsidiary;
- (a) the headings are for convenience only and do not constitute part of these Articles and shall not be used in construing these Articles;
- (b) the singular includes the plural and vice versa and words denoting any gender shall include all genders;
- (c) references to any Act, Ordinance, legislation, Rules or Regulations or any provision of the same shall be a reference to that Act, Ordinance, legislation, Rules or Regulations or provision, as amended, re-promulgated or superseded from time to time;
- (d) the terms "include" or "including" shall mean include or including without limitation;
- (e) expressions referring to writing shall, unless the contrary intention appears, be construed as including references to printing, lithography, photography, and other modes of representing or reproducing words in visible form;
- (f) words importing persons shall include bodies corporate; and
- (g) words and expressions contained in these Articles shall bear the same meaning as in the Ordinance.

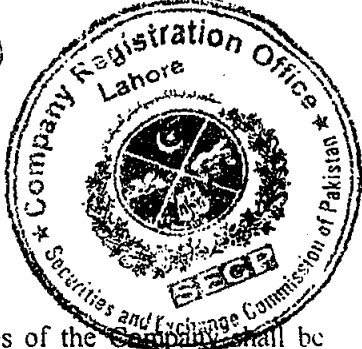
II. BUSINESS

4. Public Company

The Directors shall have regard to the restrictions on the commencement of business imposed by Section 146 if, and so far as, those restrictions are binding upon the Company.

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III. SHARES

A. General

5. Shares Under Directors' Control

Subject to Section 183 and these Articles, the shares of the Company shall be under the control of the Directors who may allot or otherwise dispose of the same to such persons, on such terms and conditions as the Directors think prudent.

6. Amount Payable on Application

No shares shall be offered to the public for subscription except upon the term that the amount payable on application shall not be less than the full amount of the nominal amount of the share.

7. Allotment of Shares

No share shall be issued at a discount except in accordance with the provisions of the Ordinance. The Directors shall, as regards any allotment of shares, duly comply with such of the provisions of Sections 68 to 73, as may be applicable to the Company. The minimum subscription upon which the Company may proceed to allot the shares shall be Rs 500,000.

8. Share Certificates

Every person whose name is entered as a member in the Register shall, free of charge, be entitled to receive within ninety (90) days after allotment or within forty-five (45) days of the application for registration of transfer, a certificate under Seal specifying the share or shares held by him and the amount paid-up thereon, including in particular and without limitation, such legends as the Company shall be obliged to affix to certain classes of share certificates as provided by law or as the Company shall have agreed to affix pursuant to any contractual arrangement in this respect; Provided, that, in respect of share or shares held jointly by several persons, the Company shall not be bound to issue more than one certificate, and delivery of a certificate for a share to one of several joint holders shall be sufficient delivery to all.

9. Certificate under Seal

The certificate of title to shares may be issued under the authority of a Director or of a committee of Directors duly authorized thereto by the Board in such manner and form as the Directors may from time to time prescribe. The Seal shall be duly affixed to every share certificate issued by the Company.

10. Issuance of Replacement Certificate

If a share certificate is defaced, lost or destroyed, it may be renewed on payment by the requesting shareholder or his representative of such fee and stamp taxes, if any, and compliance with such terms prescribed by the Directors as to evidence and indemnity and payment of expenses incurred by the Company in investigating title.

11. Joint Holders

The Company shall not be bound to register more than four persons as joint holders of any share.

12. Trusts Not Recognized

Except as required by law, no person shall be recognized by the Company as holding any share/s upon any trust, and the Company shall not be bound by or be compelled in any way to recognize (even when having notice thereof) 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 or by law otherwise provided) any other rights in respect of any share except an absolute right to the entirety thereof in the registered holder.

13. Payment of Commission

The Company may at any time pay a commission to any person for subscribing or agreeing to subscribe (whether absolutely or conditionally) for any shares, debentures or debenture stock in the Company or procuring or agreeing to procure subscriptions (whether absolutely or conditionally) for any shares, debentures or debenture stock in the Company; Provided, that, if the commission in respect of shares shall be paid or payable out of capital, the statutory requirements and conditions shall be observed and complied with, and the amount or rate of commission shall not exceed such percentage on the shares, debentures or debenture stock in each case subscribed or to be subscribed, as may be determined by the Board subject to any limits required by law. The commission may be paid or satisfied, either wholly or partly, in cash or in shares, debentures or debenture stock. The Company may also on any issue of shares pay such brokerage fees as may be lawful; Provided that such brokerage fees shall not exceed such percentage of the shares, debentures or debenture stock paid-up as may be determined by the Board, subject to any limits required by law.

14. Bar on Use of Company Funds

Except to the extent and in the manner allowed by Section 95, 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.

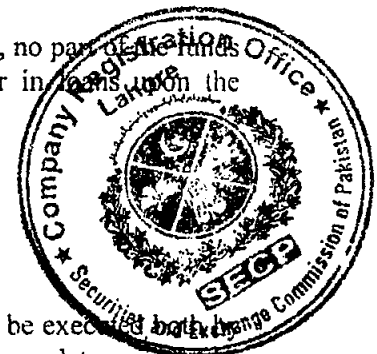
B. TRANSFER OF SHARES

15. Transfer

The instrument of transfer of any share in the Company shall be executed by the transferor and transferee, and the transferor shall be deemed to remain the holder of the share until the name of the transferee is entered in the Register in respect thereof.

16. Form of Transfer

Shares in the Company shall be transferred in the following form, or in any usual or common form which the Directors shall approve:-



(2)

(29)

Central Power Generation Company Limited

I/We, _____, of _____, in consideration of the sum of Rupees _____ paid to me by _____, of _____ (hereinafter called the "Transferee/s", for brevity), do hereby transfer to the Transferee/s the Ordinary/Preferred Share(s) numbered _____ to _____ inclusive, standing in my/our name in the books of the Central Power Generation Company Limited, to hold unto the said Transferee, his/her/their executors, administrators and assigns, subject to the several conditions on which I/We held the same at the time of the execution hereof, and I/We, the Transferee/s, do hereby agree to take the said share (s) subject to the conditions aforesaid.

Witness our hands this _____ day of _____, 1998.

Transferor

Transferee

Signature

Signature

Signed by the above-named Transferor/s and Transferee/s in the presence of:

Witnesses

Full Name, Father's/
Husband's Name

(1) _____
Signature

Nationality _____

Full Address:

Occupation _____



Full Address of
Transferee: _____

(2) _____
Signature

Occupation _____

Full Address:

(30)

17. Non- Refusal of Transfer of Shares

if

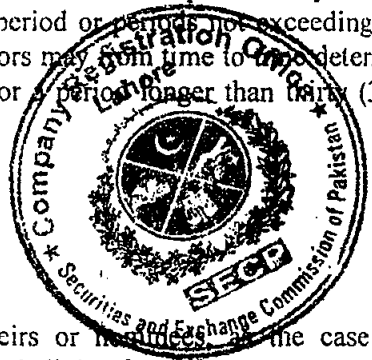
The Directors shall not transfer any fully paid shares unless the transfer deed is defective or invalid. The Director may decline to recognize any instrument of transfer, unless-

- (a) a fee not exceeding two rupees as may be determined by the Directors and the appropriate stamp tax is paid to the Company in respect thereof; and
- (b) the duly stamped instrument of transfer is accompanied by the certificate of the shares to which it relates, and such other evidence as the Directors may reasonably require to show the right of the transferor to make the transfer.

If the Directors refuse to register a transfer of shares, they shall within one Month after the date of which the transfer deed was lodged with the Company send to the transferee and the transferor notice of the refusal indicating the defect, invalidity or any ground for objection to the transferee, who shall, after removal of such defect or invalidity be entitled to re-lodge the transfer deed with the Company

18. Closure of Register

On giving seven days' prior notice in the manner provided by the Ordinance, the Register may be closed for such period or periods not exceeding forty-five (45) days in any one year as the Directors may from time to time determine; however, the Register shall not be closed for a period longer than thirty (30) days at any given time.



C. TRANSMISSION OF SHARES

19. Transmission

The executors, administrators, heirs or next of kin of a deceased member, in the case may be, of a deceased sole holder of a share shall be the only persons recognized by the Company as having any title to the share. In the case of a share registered in the names of two or more holders, the survivor or survivors shall upon proof of his right of succession be the only person or persons recognized by the Company as having any title to the share.

20. Election to Register or Transfer

Any person becoming entitled to a share in consequence of the death or insolvency of a member shall, upon such evidence being produced as may from time to time be required by the Directors, have the right, either to be registered as a member in respect of the share or, instead of being registered himself, to make such transfer of the share as the deceased or insolvent person could have made. The Directors shall, in either case, have the same right to decline or suspend registration as they would have had in the case of a transfer of the share by the deceased or insolvent person before the death or insolvency.

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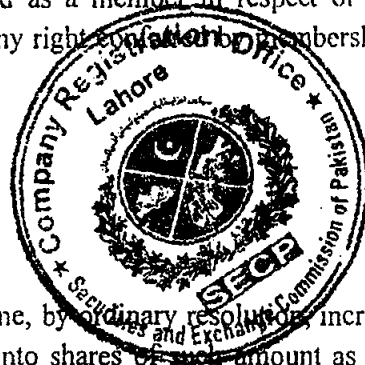
21. Rights of Person Entitled by Transmission

A person becoming entitled to a share by reason of the death or insolvency of the holder shall be entitled to the same dividends and other advantages to which he would have been entitled if he were the registered holder of the share, except that he shall not, before being registered as a member in respect of the share, be entitled in respect of it to exercise any right of membership in relation to meetings of the Company.

D. ALTERATION OF CAPITAL

22. Power to Increase Capital

The Company may, from time to time, by ordinary resolution, increase the share capital by such sum to be divided into shares of such amount as the resolution shall prescribe.



23. Further Issue of Capital

All further issue of share capital shall be subject to the applicable provisions of Section 86. Thereafter, the Directors may dispose of the same in such manner as they think most beneficial to the Company.

24. Provisions Applicable to New Shares

The new shares capital shall be subject to the same provisions with reference to transfer and transmission as the original share capital.

25. Consolidation and Subdivision

The Company may, by ordinary resolution:-

- (a) consolidate and divide its share capital into shares of larger amount than its existing shares;
- (b) subdivide its existing shares or any of them into shares of smaller amount than that fixed by the Company's Memorandum of Association, subject to the provisos to Section 92, sub-section (1), clause (d); or
- (c) 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.

26. Reduction of Share Capital

The Company may, by Special Resolution, reduce its share capital in any manner, with and subject to any incident authorized and consent required by law.

IV. MEETINGS AND PROCEEDINGS

A. GENERAL MEETINGS

27. Statutory Meeting

The statutory meeting of the Company shall be held within the period required by Section 157.

28. Annual General Meeting

The annual general meeting shall be held in accordance with the provisions of Section 158, within eighteen (18) Months from the date of incorporation of the Company and, thereafter, once at least in every year within a period of six Months following the close of its financial year and not later than fifteen Months after the holding of its last preceding annual general meeting, as may be determined by the Directors.

29. Other Meetings

All general meetings of the Company other than the statutory meeting or an annual general meeting shall be called extraordinary general meetings.

30. Extraordinary Meetings

The Directors may whenever they think necessary, call an extraordinary general meeting. Extraordinary general meetings may also be called on such requisition, or in default, may be called by such requisition, as provided under Section 159. If at any time there are not within Pakistan sufficient Directors capable of acting to form a quorum, any Director of the Company may call an extraordinary general meeting in the same manner as nearly as possible as that in which meetings may be called by the Directors.

B. Notice and Proceedings

31. Notice of Meetings

Twenty-one days' notice at the least (exclusive of the day on which the notice is served or deemed to be served, but inclusive of the day for which notice is given) specifying the place, the date and the hour of meeting and, in case of special business, the general nature of that business, shall be given in the manner provided by the Ordinance for the general meeting to such persons as are, under the Ordinance or the regulations of the Company, entitled to receive such notices from the Company.

32. Special Business

All business shall be deemed special that is transacted in an extraordinary general meeting and those transacted in an annual general meeting, with the exception of declaration dividends, the consideration of the accounts, balance sheet and the reports of the Directors and auditors, the election of Directors, and the appointment and fixing of the remuneration of auditors.



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33. Quorum

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. Three members present personally who represent not less than twenty-five percent of the total voting power either on their own account or as proxies shall be a quorum.

34. Effect of Quorum Not Being Present

If within half an hour from the time appointed for the meeting a quorum is not present, the meeting, if called upon the requisition of 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 the adjourned meeting a quorum is not present within half an hour from the time appointed for the meeting, the members present, being not less than three, shall be a quorum.

35. Chairman of Meeting

The Chairman of the Board of Directors, if any, shall preside as chairman at every general meeting of the Company, but if there is no such Chairman, or if at any meeting he is not present within fifteen minutes after the time appointed for the meeting, or is unwilling to act as chairman, any one of the Directors present may be elected to be the chairman, and if none of the Directors is present, or willing to act as chairman, the members present shall choose one of their number to be the chairman.

36. Adjournment

The Chairman may, with the consent of any meeting at which a quorum is present and shall if so directed by the majority of members present), adjourn the meeting from time to time but no business shall be transacted at any adjourned meeting other than the business left unfinished at the meeting from which the adjournment took place. When a meeting is adjourned for ten 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.

37. Voting

A resolution put to the vote in any general 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. Unless a poll is so demanded, a declaration by the Chairman that a resolution has, on a show of hands, been carried, or carried unanimously, or by a particular majority, or lost, and an entry to that effect in the minutes of the proceedings of the Company shall be conclusive evidence of the fact, without proof of the number or proportion of the votes recorded in favor of, or against, that resolution.

38. Demand for a Poll

A poll may be demanded only in accordance with the provisions of Section 167.



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39. Manner of Taking a Poll

If a poll is duly demanded, it shall be taken in accordance with the manner laid down in Section 168 and the result of the poll shall be deemed to be the resolution of the meeting at which the poll was demanded.

40. Time of Taking a Poll

A poll demanded on the election of Chairman or on a question of adjournment shall be taken at once.

41. Casting Vote

In the case of an equality of votes, whether on a show of hands or on a poll, the chairman of the meeting at which the show of hands takes place or at which the poll is demanded, shall have and exercise a second or casting vote.

C. Votes of Members

42. Right to Vote

Subject to any rights or restrictions for the time being attached to any class or classes of shares, on a show of hands every member present shall have one vote except for election of Directors in which case the provisions of Section 178 shall apply. On a poll, every member shall have voting rights as laid down in Section 160.

43. Voting By Joint Holders

In case of joint-holders, the vote of the senior who tenders a vote, whether in person or by proxy, shall be accepted to the exclusion of the votes of the other joint-holders. For this purpose, seniority shall be determined by the order in which the names stand in the Register.

44. Voting; Corporation Representatives

On a poll, votes may be given either personally or by proxy; Provided, the body corporate shall vote by proxy as long as a resolution of its directors in accordance with the provisions of Section 162 of the Ordinance is in force.

45. Proxy to be in Writing

The instrument appointing a proxy shall be in writing under the hand of the principal to his attorney duly authorized in writing. A proxy must be a member of the Company.

46. Instrument Appointing Proxy to be Deposited

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 that power or authority, shall be deposited at the Office of the Company not less than forty-eight (48) hours before the time for holding the meeting at which the person named in the instrument proposes to vote and in default the instrument of proxy shall not be treated as valid.

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47. Form of Proxy

An instrument appointing a proxy may be in the following form, or a form as near thereto as may be:

CENTRAL POWER GENERATION COMPANY LIMITED

I, _____, of _____, in the District of _____, being a member of Central Power Generation Company Limited, hereby appoint _____ of _____, as my proxy to vote for me and on my behalf at the (annual/extraordinary as the case may be) general meeting of the Company to be held on the _____ day of _____ and at any adjournment thereof.

48. Revocation of Authority

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 was executed, or the transfer of the share in respect of which the proxy is given; Provided, that, no intimation in writing of such death, insanity, revocation or transfer as aforesaid shall have been received by the Company at its Office before the commencement of the meeting or adjourned meeting at which the proxy is used.

V. MANAGEMENT AND ADMINISTRATION

A. Board of Directors

49. Number of Directors

The number of Directors shall not be less than seven. The first Directors, to hold office until the first annual general meeting, shall be:-

- (1) Mr. Abdul Waris Khan
- (2) Ch. Abdul Ghafoor
- (3) Mr. Muhammad Ahmad
- (4) Mr. Javed Nizam
- (5) Mr. Nawaz Ali Samejo
- (6) Mr. Inayat Ullah
- (7) Ch. Mushtaq Ahmed



50. Qualification of Directors

Save as provided in Section 187, no person shall be appointed as a Director unless he is a member of the Company.

51. Chairman of the Board

The Directors may elect one of their number as the Chairman of the Board and vest in him such powers and functions as they may deem fit in relation to the management and administration of the affairs of the Company subject to their general supervision and control.

52. Chief Executive

The Directors may elect one of their number to be the Chief Executive of the Company in accordance with the provisions of Sections 198 and 199 and vest in him such powers and functions as they deem fit in relation to the management and administration of the affairs of the Company subject to their general supervision and control. The Chief Executive of the Company shall be the *ex-officio* Vice-Chairman of the Board. The provisions of the Ordinance shall be observed regarding other matters relating to the Chief Executive.

53. Remuneration

Subject to any approval or limits required by law, the terms and conditions of remuneration of:-

- (a) Director for performing extra services, including the holding of office of Chairman;
- (b) the Chief Executive; and
- (c) any Director for attending the meetings of the Directors or a Committee of Directors shall be determined by the Board of Directors.



54. Alternate Director

A Director may, with the approval of the Board, appoint any person (including another Director) to be his alternate Director and such an alternate Director shall be entitled to notice of meetings of the Directors and to attend and vote thereat accordingly and, generally, to exercise all the rights of such absent Director, subject to any limitations in the instrument appointing him. For the purposes of the proceedings at such meetings, the provisions of these Articles shall apply as if any alternate Director (instead of his appointer) were a Director. An alternate Director shall not require any share qualification and he shall *ipso facto* vacate office as and when his appointer (a) vacates office as a Director; (b) removes the appointee from office; or (c) returns to Pakistan; Provided, that, upon each occasion upon which the appointer thereafter leaves Pakistan again, and unless the appointer shall have informed the Company to the contrary, he shall be deemed to have re-appointed the appointee as his alternate Director and no further approval of the Board shall be required unless the appointer desires to approve another person not previously approved by the Board as his alternate. If an alternate Director shall be himself a Director, his voting rights shall be cumulative but he shall not be counted as more than one for quorum purposes. Any appointment or removal under this Article shall be reflected by notice in writing under the hand of the Director making the same.

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B. POWERS AND DUTIES OF DIRECTORS

55. General Management Powers

The business of the Company shall be managed by the Directors, who may exercise all such powers of the Company as are not by the Ordinance or by these regulations, required to be exercised by the Company in general meeting, subject nevertheless to the provisions of the Ordinance or to any of these Articles, and such regulations being not inconsistent with the aforesaid provisions, as may be prescribed by the Company in a general meeting; but no regulation made by the Company in general meeting shall invalidate any prior act of the Directors which would have been valid if that regulation had not been made.

56. Borrowing Powers

The Directors may exercise all the powers of the Company to raise money otherwise than by issue of shares and to mortgage, charge, pledge, hypothecate or otherwise create an encumbrance on its undertaking or any part thereof and to issue debentures and other securities whether outright or as security for any obligation, liability or debt of the Company or of any third party. In exercising the aforesaid powers of the Company the Directors may, from time to time and on such terms and conditions as they think fit, raise money from banks and financial institutions and from other persons under any permitted system of financing, whether providing for payment of interest or some other form of return, and in particular the Directors may raise money on the basis of mark-up price, musharika, modaraba or any other permitted mode of financing, and without prejudice to the generality of the foregoing, the Directors may exercise all or any of the powers of the Company under Section 196(2) of the Ordinance. In particular, the Directors may issue any security as defined in Section 2(1)(34) of the Ordinance or may issue any instrument or certificate representing redeemable capital as defined in 2(1)(30A) of the Ordinance or participatory redeemable capital as defined in Section 2(1)(25) of the Ordinance.

Duties of Directors

The Directors shall duly comply with the provisions of the Ordinance.

58. Minute Books

The Directors shall cause minutes to be made in books provided for the purpose of:-

- (a) all appointments of officers made by the Directors;
- (b) the names of the Directors present at each meeting of the Directors and of any committee of the Directors; and
- (c) all resolutions and proceedings at all meetings of the Company and of the Directors and of committees of Directors; and every Director present at any meeting of Directors or committee of Directors shall sign his name in a book to be kept for that purpose.



C. DISQUALIFICATION OF DIRECTORS

59. Disqualification of Directors

No person shall become a Director of the Company if he suffers from any of the disabilities or disqualifications mentioned in Section 187 of the Ordinance and, if already a Director, shall cease to hold such office from the date he so becomes disqualified or disabled or:-

- (a) if removed by general or special order of the holding company;
- (b) if removed by a resolution of members as hereinafter provided; or
- (c) if by notice in writing given to the Company he resigns his office;

Provided, however, that no Director shall vacate his office by reason only of his being a member of any company which has entered into contracts with, or done any work for, the Company but such Director shall not vote in respect of any such contract or work, and if he does so vote, his vote shall not be counted.

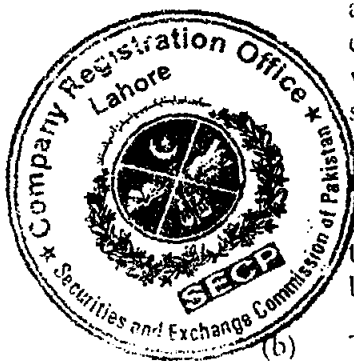
D. PROCEEDINGS OF DIRECTORS.

60. Meetings of Directors

- (a) The Directors may meet together for the dispatch of business, adjourn and otherwise regulate their meetings, as they deem proper. Questions arising at any meeting shall be decided by a majority of votes. In case of an equality of votes, the Chairman shall have and exercise a second or casting vote. A Director may, and the secretary on the requisition of a Director shall, at any time, summon a meeting of Directors. Seven (7) days' notice at the least, exclusive of the day on which the notice is served or deemed to be served, but inclusive of the day for which notice is given, shall be given for a meeting of Directors; Provided, that, if all the Directors entitled to attend and vote at any such meeting so agree, in writing, a meeting may be held of which less than seven (7) days' notice has been given.

- (b) The quorum for the meeting of directors shall not be less than one third of their number or four whichever is greater.

- (c) A meeting of the Directors may consist of a conference between Directors, some or all of whom are in different places; Provided, that, each Director who participates is able to hear each of the other participating Directors addressing the meeting and, if he so wishes, to address each of the other participating Directors simultaneously, whether directly, by conference telephone or by any other form of communications equipment (whether in use when this Article 60(c) is adopted or developed subsequently) or by a combination of methods. A quorum shall be deemed to be present if those conditions are satisfied in respect of the minimum number and designation of Directors required to form a quorum. A meeting held in this way shall be deemed to take place at the place where the largest group of Directors is assembled or, if no such group is readily identifiable, at the place from where the Chairman participates. Any Director may, by prior notice to the Secretary, indicate that he wishes to participate in the meeting in such manner, in which event, the Directors shall procure that an appropriate conference facility is arranged.



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61. Chairman of Directors' Meetings

The Chairman of the Board shall preside at all meetings of the Board but, if at any meeting the Chairman is not present within ten minutes after the time appointed for holding the same or is unwilling to act as Chairman, the Directors present may choose one of their number to be chairman of the meeting.

62. Committees

The Directors may delegate any of their powers not required to be exercised in their meeting to committees consisting of such member or members of their body as they think fit. Any committee so formed shall, in the exercise of the powers so delegated, conform to any restrictions that may be imposed on it by the Directors.

63. Chairman of Committee Meetings

A committee may elect a chairman of its meetings but, if no such chairman is elected, or if at any meeting the chairman is not present within ten minutes after the time appointed for holding the same or is unwilling to act as chairman, the members present may choose one of their number to be chairman of the meeting.

64. Proceedings of Committee Meetings

A committee may meet and adjourn as it thinks fit. Questions arising at any meeting shall be determined by a majority of votes of the members present. In case of an equality of votes, the chairman shall have and exercise a second or casting vote.

Validity of Directors' Acts

All acts done in any meeting of the Directors or of a committee of Directors shall, notwithstanding that it be afterwards discovered that there was some defect in the appointment of such Directors or that they or any of them were disqualified, be as valid as if every such person had been duly appointed and was qualified to be a Director unless the said act or acts is *ultra vires* in itself.

66. Resolution in Writing

A resolution in writing circulated to all the Directors and signed by a majority of the total number of Directors or affirmed by them through fax, telex or telegram shall be as valid and effectual as if it had been passed at a meeting of the Directors duly convened and held.

E. ELECTION AND REMOVAL OF DIRECTORS

67. Rotation of Directors

At the first annual general meeting of the Company, all the Directors shall retire from office, and Directors shall be elected in their place in accordance with Section 178 for a term of three years.

68. Eligibility for Re-election

A retiring Director shall be eligible for re-election



69. Election in Accordance with the Ordinance

The Directors shall comply with the provisions of Sections 174 to 178 and Sections 180 and 184 relating to the election of Directors and matters ancillary thereto.

70. Filling of Casual Vacancy

Any casual vacancy occurring in the Board of Directors may be filled 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.

71. Removal of Director

The Company may remove a Director but only in accordance with the provisions of the Ordinance.

VI. THE SEAL

72. Common Seal

The Directors shall provide a common seal of the Company which shall not be affixed to any instrument except by the authority of a resolution of the Board or by a committee of Directors authorized in that behalf by the Board. Two (2) Directors or one Director and the secretary of the Company shall sign every instrument to which the common seal is affixed.

73. Official Seal

The Directors may provide for the use in any territory, district or place not situated in Pakistan, of an official seal which shall be a facsimile of the common seal of the Company, with the addition on its face of the name of every territory, district or place where it is to be used. The provisions of Section 213 shall apply to the use of the official seal.

VII. DIVIDENDS AND RESERVE

74. Declaration of Dividends

The Company in general meeting may declare dividends but no dividend shall exceed the amount recommended by the Board.

75. Interim Dividends

The Board may from time to time direct payment to the members or to the holding company such interim dividends as appear to be justified by the distributable profits of the Company.



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76. Dividends Payable Out of Profits

No dividends shall be paid otherwise than out of distributable profits of the year or any other undistributed profits. No unpaid dividend shall bear interest against the Company.

77. Dividends Payable on Amount Paid on Shares

All dividends shall be declared and paid according to the amounts paid on the shares.

78. Reserve Fund

The Directors may, before recommending any dividend, set aside out of the profits available for distribution of the Company such sums as they think proper as a reserve or reserves which shall, at the discretion of the Directors, be applicable for meeting contingencies, or for equalizing dividends, or for any other purpose to which the profits of the Company may be properly applied, and pending such application may either be employed in the business of the Company or be invested in such investments (other than shares of the Company) as the Directors may, subject to the provisions of the Ordinance, from time to time think fit.

79. Profit Carried Forward

The Directors may carry forward any profits which they may think prudent not to distribute, without setting them aside as a reserve.

80. Payment of Dividends Specie

With the sanction of a resolution in a general meeting, any dividend may be paid wholly 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. The Directors may 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 members, and may vest any such specific assets in trust for the members entitled to the dividend as may seem expedient to the Directors.

81. Dividends to Joint Holders

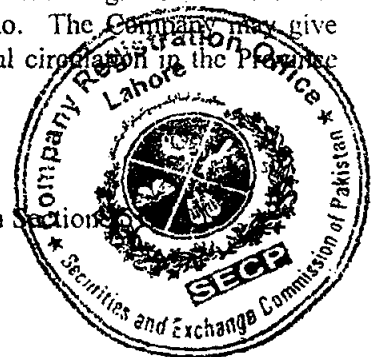
If several persons are registered as joint holders of any share, any one of them may give effectual receipt for any dividend payable on the share.

82. Notice of dividend

Notice of any dividend that may have been declared shall be given in the manner hereinafter mentioned to the persons entitled thereto. The Company may give such notice by publication in a newspaper of general circulation in the Province where the Office is situated.

83. Period for Payment of Dividends

Dividends shall be paid within the period specified in Section



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VIII. ACCOUNTS

84. Books of Account

The Directors shall cause to be kept proper books of account as required under Section 230.

85. Place Where Accounts Kept

The books of account shall be kept at the Office or at such other place as the Directors shall think fit and shall be open to inspection by the Directors during business hours.

86. Inspection by Members

The Directors, or their representatives, shall from time to time determine whether and to what extent and at what time and place/s and under what conditions or regulations the accounts and books or papers of the Company or any of them shall be open to the inspection of members not being Directors. No member (not being a Director) shall have any right of inspecting of any account and book or papers of the Company, except as conferred by law or authorized by the Directors or by the Company in general meeting.

87. Annual Accounts

The Directors shall as required by Sections 233 and 236 cause to be prepared and to be laid before the Company in general meeting such profit and loss accounts and balance sheets duly audited and reports as are referred to in those sections.

88. Balance Sheet and Profit and Loss Account

A balance sheet, profit and loss account, and other reports referred to in the preceding Article shall be made out every year and laid before the Company in the annual general meeting made up to a date not earlier than six months before such meeting. The balance sheet and profit and loss account shall be accompanied by report of the auditors of the Company and the report of Directors.

89. Copy of Accounts to be Sent to Members

A copy of the balance sheet and profit and loss account and reports of Directors and auditors shall, at least twenty-one days preceding the meeting, be sent to the persons entitled to receive notices of general meetings in the manner in which notices are to be given as hereinafter provided.

90. Compliance with the Ordinance

The Directors shall in all respects comply with the provisions of Sections 230 to 236.



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91. Capitalization of Profits

The Company in general meeting may, upon the recommendation of the Directors, resolve that it is desirable to capitalize any part of the amount for the time being standing to the credit of any of the Company's reserve accounts or to the credit of the profit and loss accounts or otherwise available for distribution. The Company may then set free such sum for distribution among the members who would have been entitled thereto if distributed by way of dividend and in the same proportions, on condition that the same be not paid in cash but be applied in or towards paying up in full un-issued shares or debenture of the Company to be allotted and distributed, credited as fully paid up to and amongst such members in the proportion aforesaid. The Board of Directors shall give effect to such distribution by resolution.

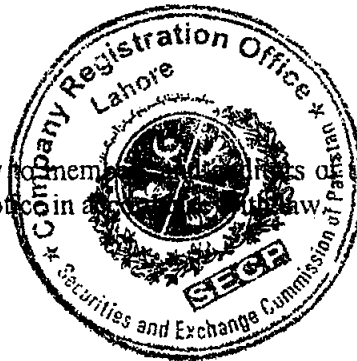
92. Audit

Auditors shall be appointed and their duties regulated in accordance with Sections 252 to 255 of the Ordinance.

IX. NOTICES

93. Notice to Members, etc.

Notice shall be given by the Company to members, directors of the Company and other persons entitled to receive notice in accordance with the law.



X. CONFIDENTIALITY

94. Confidentiality Undertaking

Every director, manager, adviser, auditor, trustee, member of a committee, officer, agent, accountant, or other employees of the Company shall, if so required by the Directors, before entering upon his duties, sign a confidentiality undertaking in relation to all transactions of the Company with its customers and the state of accounts with individuals and in matters relating thereto, and shall undertake not to reveal any of the matters which may come to his knowledge in the discharge of his duties, except when required to do so by the Directors or by any general meeting or by any court of law of competent jurisdiction and except so far as may be necessary in order to comply with any of the provisions in these presents.

95. Members' Access to Company Premises

No member or other person (not being a Director) shall be entitled to enter upon the property of the Company or examine the Company's premises or properties without the permission of a Director, subject to Article 94, 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 will be inexpedient, in the interest of the Company and its members, to communicate.

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XI. RECONSTRUCTION

96. Reconstruction

On any sale of the undertakings of the Company, the Directors or the liquidators on a winding up may, if authorized by a Special Resolution, accept fully paid shares, debentures or securities of any other company, either then existing or to be formed for the purchase in whole or in part of the property of the Company. The Directors (if the profits of the Company permit), or the liquidators (in a winding up), may distribute such shares or securities, or any other properties of the Company amongst the members without realization, or vest the same in trustees for them. A Special Resolution may provide for the distribution or appropriation of the cash, shares or other securities, benefits or property, and for the valuation of any such securities or property at such price and in such manner as the meeting may approve. All shareholders shall be bound by any valuation or distribution so authorized, and waive all rights in relation thereto save only such statutory rights (if any) as are, in case the Company is proposed to be or is in the course of being wound up, incapable of being varied or excluded by these Articles.

XII. WINDING UP

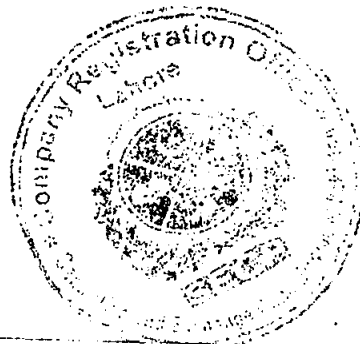
97. Division and distribution of Assets Upon Dissolution

If the Company is wound up, the liquidator may, with the sanction of a Special Resolution of the Company and any other sanction required by law, divide amongst the members in specie or kind the whole or any part of the assets of the Company (whether they shall consist of property of same kind or not) and may, for such purpose, set such value as he deems fair upon any property to be divided as aforesaid and may determine how such division shall be carried out as between the members or different classes of members. The liquidator may, with like sanction, vest the whole or any part of such assets in trustees upon such trust for the benefit of the contributors, as the liquidator with like sanction, shall think fit: Provided, that, no member shall be compelled to accept any shares or other securities whereon there is any liability.

XIII. INDEMNITY

98. Indemnification

Every officer or agent of the Company may be indemnified out of the assets of the Company for any liability incurred by him in defending any proceedings, whether civil or criminal, arising out of his dealings in relation to the affairs of the Company, except those brought by the Company against him, in which judgement is given in his favour or in which he is acquitted, or in connection with any application under Section 488 in which relief is granted him by a court of competent jurisdiction.



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XIV. ARBITRATION

99. Differences to be Referred to Arbitrator

Every intra-corporate dispute shall, as a condition precedent to any other action at law be referred, in conformity with the Arbitration Act, 1940, as amended, and its implementing rules, to the decision of an arbitrator to be appointed by the parties in dispute or, if they cannot agree upon a single arbitrator, to the decision of two arbitrators of whom one shall be appointed by each of the parties in dispute, or, in the event of the two arbitrators not agreeing, then of an umpire to be appointed by the two arbitrators, in writing, before proceeding on the reference. Such decision and arbitral award shall be final and binding on the parties. Intra-corporate disputes shall include any dispute that may arise between the Company on the one hand and any of the members, their executors, administrators or assigns on the other hand, or between members, their executors, administrators or assigns, relating to these Articles or the statutes, or anything then or thereafter done, executed, omitted or suffered in pursuance of these Articles or of the statutes or any breach or alleged breach, or otherwise relating to these Articles or to any statute affecting the Company or to any of the affairs of the Company.





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 shares in the capital of the Company set opposite our respective names.

Name and surname (Present and former) in full (in Block Letters)	Father's, Husband's Name in Full	Nationality	Occupation	Residential Address in Full	Number of Shares taken by each Subscriber	Signature
1. Mr. Abdul Waris Khan	Abdul Wajid	Pakistani	Wapda Service	A-1, Wapda Colony, TPS, Muzaffargarh	1	<i>Abdul Waris Khan</i>
2. Ch. Abdul Ghafoor	Ch. Shah Muhammad	Pakistani	Wapda Service	688-Canal View, Lahore.	1	<i>Abdul Ghafoor</i>
3. Mr. Muhammad Ahmad	Mehboob Ahmad	Pakistani	Wapda Service	10-Pak Block, Allama Iqbal Town, Lahore.	1	<i>Muhammad Ahmad</i>
4. Mr. Javed Nizam	Muhammad Islam	Pakistani	Wapda Service	263-Tariq Block, Allama Iqbal Town, Lahore.	1	<i>Javed Nizam</i>
5. Mr. Nawaz Ali Samejo	Abdul Rahim	Pakistani	Wapda Service	K-13, Wapda Colony, TPS, Guddu, Kashmir Distt. Jacobabad.	1	<i>Nawaz Ali Samejo</i>
6. Mr. Inayat Ullah	Saif Ullah Khan	Pakistani	Wapda Service	Bungalow No.34-B, Wapda Officer's Colony, Upper Mall, Lahore.	1	<i>Inayat Ullah</i>
7. Ch. Mushtaq Ahmed	Ch. Jan Muhammad	Pakistani	Wapda Service	15-E, Model Town, Lahore.	1	<i>Mushtaq Ahmed</i>

Total number of shares taken 7 (Seven)

Dated the 19 day of October, 1998

Witness to the above signatures

(Full Name, Father's/Husband's Name)

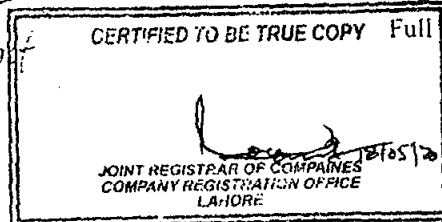
(in Block Letters) Muhammad Jamil

S/O Muhammad Jamil

Signature *M. Jamil*

Occupation Service

Full Address 188-B, Board of 22 Revenue Society Lahore



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ANNEX-E

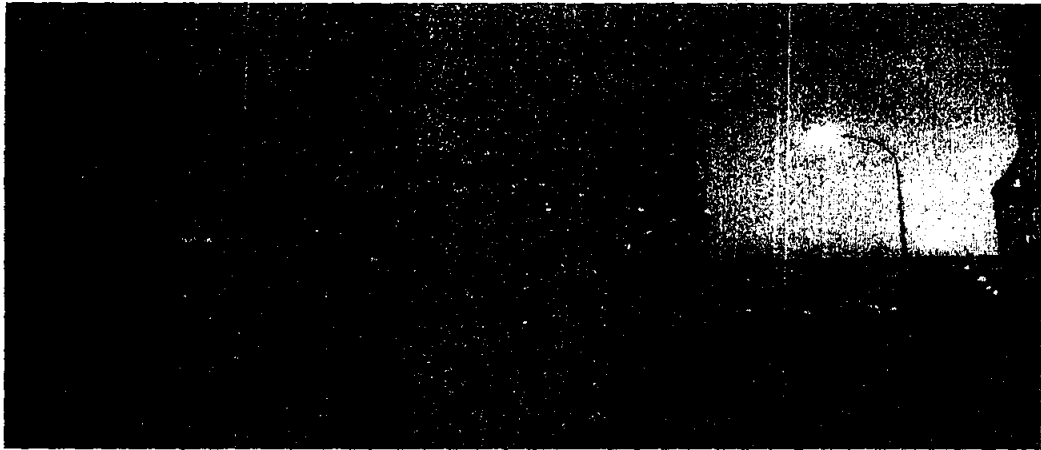
ANNUAL REPORT FOR FY 2019-20

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Central Power Generation Company Limited



Annual Report for FY 2019-20

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CENTRAL POWER GENERATION COMPANY LIMITED

DIRECTOR'S REPORT TO THE MEMBERS

The Directors of the Company are pleased to present 22nd Annual Report of the Company, together with the Audited Financial Statements and Auditors' Report, for the year ended on June 30, 2020.

2. Central Power Generation Company Limited is unlisted Public Limited Company (Public Sector) with its registered office at WAPDA House Lahore. The Company incorporated on October 26, 1998 and the Certificate of Commencement of Business issued on December 07, 1998, and started its commercial operations on March 01, 1999. The Company is 100% owned by the Government of Pakistan through Ministry of Energy (Power Division). The Public Sector Companies (Corporate Governance) Rules 2013 are applicable on the Company and the Board. The Government of Pakistan appoints the Board of Directors.

3. The principal activities of the Company are to own, operate and maintain power generation facilities. Currently, three Thermal Power Stations with total installed capacity of 2,532.64 MW owned by the company. These plants are located at Guddu, Quetta, and Sukkur. The installed capacity of these individual power plants is as under:

Place	No. of Units	Units in Operations	Installed Capacity (MW)
Guddu	13	13	1,655.00
747MW	03	03	776.70
Quetta	04	01	50.94
Sukkur	04	0	50.00
Total			2,532.64

The detail is as under:

Block	No.	Type	Manufacturer	Installed Capacity (MW)	
				Year	Capacity
Block-I	11	Gas	Seimens Germany	1992	136
	12			1992	136
	13			1994	143
	Total				415
Block-II	5	Gas	GE USA	1987	100
	6			1988	100
	7	Gas Turbine	1985	100	
	8		1986	100	
	9		1986	100	
	10		1986	100	
	Total				600

hmm

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Block-III	3	Gas	Steam	Russia	1980	210	Decommissioned on July 2019	
	4			China	1985	210		
	Total					420		
Block-IV	1	Gas	Steam	Czechoslovakia	1974	110		
	2				1974	110		
	Total					220		
Block-V 747 MW	14	Gas	GT	GE - USA & HEI - China	2014	256	243	
	15				2014	256	243	
	16		ST		2014	266	261	
	Total					777	747	
TPS Quetta	1	Coal	Steam Turbine	Ladewal - USA	1964	8	Decommissioned	
	2		Steam Turbine	Ladewal - USA	1964	8		
	3	Gas	Gas Turbine	Fiat - Italy	1972	-		
	6			Mitsubishi - Japan	1984	35		22
	Total					51		22
TPS Sukkur	1	Gas	Steam Turbine	GE - Canada	1965	13	Decommissioned	
	2		Steam Turbine	GE - Canada	1965	13		
	3		Steam Turbine	GE - Canada	1967	13		
	4		Steam Turbine	GE - Canada	1967	13		
	Total					50		
Grand Total						2,533	1,579	

4. The Capacity of Quetta Thermal Power Station was 88.19 MW with 06 Units. The Units No. 4 and 5 having capacity of 12.5 MW and 25 MW respectively, were shifted to Panjgoor under QESCO in November 1999. Units No. 1, 2 and 3 have completed their useful live and are no operative. The remaining capacity of this station is only 25 MW of Unit No. 6. The generation license issued for unit no. 6, by NEPRA on July 10, 2019, although non-operative due to non-availability of Gas quota and tariff.

5. The operation of Thermal Power Station Sukkur was discontinued in April 2000 on account of technical reasons (inefficient units), and is decommissioned.

6. Moreover, Company has installed Block V, state of art plant 747MW, CCGP, in Guddu having efficiency of 49% and 92% availability with dual fire operation i.e. natural gas and HSD. The plant remained under trial run and testing phase March 2014 to Dec-2014 and achieved COD on December 17, 2014. Since then, plant is in continuous successful operation.

7. The authorized capital of the Company is Rs. 50,000,000,000/- divided into 5,000,000,000 ordinary shares of Rs. 10 each. In total 50,000/- shares have been issued and out of which one share of Rs. 10 each has been issued to seven directors of the Company and 49,993 shares were issued to WAPDA which were subsequently transferred in the name of President Islamic Republic of Pakistan. Moreover, an amount of Rs. 3,343.919 Million is appearing as deposit against issue of shares to WAPDA.

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FINANCIAL RESULTS

8. The financial information of the Company covering business activities for the period ended June 30, 2020. Operating results summarized below:

(Rupees in thousands)

Description	Jul-19 to Jun-20	Jul-18 to Jun-19
Revenue	68,935,625	79,222,801
Operations, Maintenances and Administrative Expenditures	(62,759,871)	(70,054,767)
Finance Cost	(3,033,294)	(4,173,593)
Taxation	(1,932,924)	(1,477,599)
Net Profit / (Loss) after tax	1,209,536	3,516,842
Add: Depreciation	5,713,922	5,007,823
Finance Cost	3,033,294	4,173,593
Taxation	1,932,924	1,477,599
Operating Profit	11,889,676	14,175,857

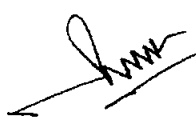

9. Revenue from sale of electricity in these accounts is based on the actual billing made for old Guddu plants and 747 MW CCPP, on NEPRA's approved tariff, to the Central Power Purchasing Agency (Guarantee) Limited (CPPA-G), on account of electricity supplied during the period under consideration. Electricity tariff has been charged to CPPA-G, which is sole purchaser of the power from the Company.

10. The NEPRA determination and notified tariff dated 26th July, 2004. The 2nd tariff petition was filed with NEPRA in May 2005 by the management of Company for approval of Reference Tariff for three (3) years i.e. 2005, 2006, 2007. NEPRA gave determination on petition on 24th February 2006 which was subsequently notified by the Government of Pakistan on 24th June 2006. In the current year previously notified tariff applied after adjustment of CPI (Consumer Price Index) for the old Guddu plant from Blocks (I - IV) and tariff determination of 747 MW CCP Guddu for new power plant notified by NEPRA on quarterly basis. The average approved tariff for the period under review is as under:-

Energy Purchase Price ("EPP")	Rs. 7.75 per KWh
Capacity Purchase Price ("CPP")	Rs. 2,533.54 per KW per Month
Estimated Dependable Capacity	1,640.790 MW as invoiced

11. Followings are the financial results compared with last year results.

	FY 2019-20	FY 2018-19 (Restated)
Energy unit sold (GWh)	5,921.761	9,384.298

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CORPORATE GOVERNANCE COMPLIANCE

12. The Company complies with all the principal of Public Sector Corporate Governance Rules. The Financial Statements are prepared on the adopted International Financial Reporting Standards and present true and fair view of the state of affairs of the company. The sound internal control are in place and overall improvements in the systems and operations are appearing.

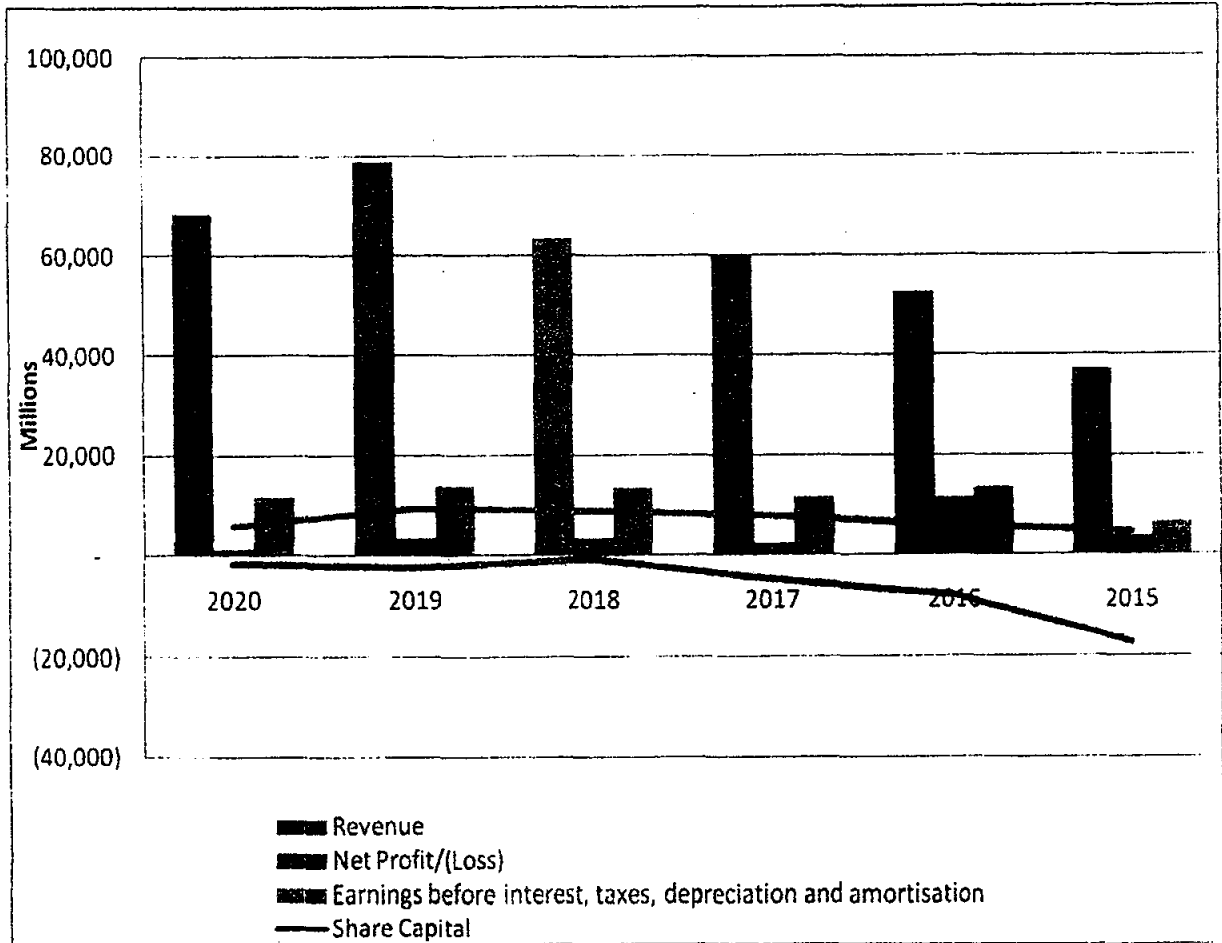
13. Key Operating and Financial data for last six years is, summarized below:

SIX YEARS OPERATIONAL AND FINANCIAL DATA

Description	2019-20	2018-19	2017-18	2016-17	2015-16	2014-15
OPERATIONAL PERFORMANCE	(UNITS MkwH)					
Units Generated (NEO)	5,921.761	9,384.298	8,775.785	7,951.816	6,005.575	4,750.473
Per Unit Cost (Rs./kWh)	7.7476	6.188	5.179	5.498	6.053	5.587
PROFIT AND LOSS ACCOUNT	(RS. IN MILLION)					
Revenue	68,405.062	78,735.612	63,651.576	60,072.227	52,689.872	36,961.157
Cost of goods sold	(61,780.426)	(68,561.713)	(55,464.640)	(51,316.502)	(42,806.884)	(31,958.977)
Gross profit	6,624.636	10,173.899	8,186.936	8,755.726	9,882.988	5,002.180
Operating profit	5,645.191	8,680.844	7,322.490	7,483.084	8,700.587	4,543.594
Profit before tax	3,142.460	4,994.440	6,431.473	8,035.649	10,595.647	5,116.476
Profit after tax	1,209.536	3,516.842	3,358.211	2,453.572	11,481.008	3,805.898
Earnings before interest, taxes, depreciation and amortization	11,691.086	13,856.948	13,769.359	11,733.938	13,576.357	6,750.580
BALANCE SHEET	(RS. IN MILLION)					
Share Capital	(1,418.290)	(2,273.781)	(665.241)	(4,578.727)	(7,873.765)	(17,266.818)
Property, plant and equipment	101,901.574	105,871.790	96,378.931	83,003.004	80,317.102	81,811.050
Inventory	928.352	928.352	870.461	556.963	450.384	939.570
Current assets	89,297.577	72,008.592	30,911.439	11,507.017	11,089.562	9,722.607
Current liabilities	121,592.979	105,815.754	60,347.036	35,710.335	34,782.347	44,282.717
Non-current assets	101,954	105,921.230	96,428.219	85,051.958	85,689.308	82,091.625
Noncurrent liabilities	71,076.398	74,387.930	67,657.944	65,427.448	69,870.369	64,798.418
SUMMARY OF CASH FLOW STATEMENTS	(RS. IN MILLION)					
Cash flows from operating activities	13,021.474	9,816.131	19,740.997	10,125.524	(4,749.327)	7,494.900
Cash flows from investing activities	(805.825)	(89.258)	(12,167.559)	(5,413.286)	(633.725)	(12,368.129)
Cash flows from financing activities	(8,154.592)	(6,908.184)	(5,579.836)	(5,407.706)	4,761.990	3,037.765
Cash and cash equivalents at the beginning of the year	6,105.556	3,286.867	1,293.265	1,988.733	2,609.795	4,445.259
Net cash flows during the year	10,166.613	6,105.556	3,286.867	1,293.265	1,988.733	2,609.795
FINANCIAL INDICATORS	%					
Profitability Ratios						
Gross profit ratio	9.68%	12.92%	12.86%	14.58%	18.76%	13.53%
Net profit ratio	1.77%	4.47%	5.28%	4.08%	21.79%	10.30%
EBITDA margin	17.09%	17.60%	21.63%	19.53%	25.77%	18.26%
Return on equity	-5.83%	-18.27%	-14.07%	-6.41%	-18.04%	-4.50%

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LIQUIDITY RATIOS	RATIO					
	Current ratio	0.73 : 1	0.68 : 1	0.51 : 1	0.32 : 1	0.32 : 1
Quick ratio	0.73 : 1	0.67 : 1	0.50 : 1	0.31 : 1	0.31 : 1	0.20 : 1
	%					
Cash flows from operations to sales	19.04%	12.47%	31.01%	16.86%	-9.01%	20.28%
Cash to current liabilities	8.36%	5.77%	5.45%	3.62%	5.72%	5.89%
Earnings per share (Rs.)	24.19	70.34	67.16	49.07	229.62	76.12



PATTERN OF SHARE HOLDING

14. The total Nine (09) number of Directors as following:

- i. **Male: Nine (9)**
- ii. **Female: Nil**

15. During the year 2020, details of Board and Board Committee meetings and their attendance by the Directors are as under:

[Handwritten signatures]

(54)

Sr	Directors	B&D Meetings	Audit Committee	Risk Management Committee	Procurement Committee	HR Committee	Nomination Committee
		Total =9	Total = 6	Total = 2	Total = 6	Total = 5	Total = 1
1	Syed Tahir Nawazish Independent Director	9	-	2	-	5	1
2	Prof. Nisar Ahmed Siddiqui Independent Director	3	-	1	-	-	1
3	Mr. Muhammad Aslam Shaikh Independent Director	9	6	2	6	-	-
4	Mr. Abdul Qayum Malik Independent Director	9	-	-	6	5	1
5	Dr. Arshad Mahmood Non-Executive Director	3	1	-	-	-	-
6	Mr. Tariq Viqar Bakhshi Non-Executive Director	1	1	-	1	-	-
7	Mr. Sajjad Ahmed Non-Executive Director	7	3	-	3	3	1
8	Mr. Muhammad Imran Non-Executive Director	8	6	-	6	5	-
9	Engr. Nadeem Ahmed CEO – CPGCL	1	1	1	1	-	-
10	Engr. Hammad Amer Hashmi CEO – CPGCL	8	5	1	5	5	1

DIRECTORS' REMUNERATION

16. The current remuneration of Directors was approved by Ministry of Water & Power vide letter No. GPI-1(1)2012 dated 4th October 2016 and adopted in 72nd meeting of Board of Directors held on 20th October, 2016. According to the approval, an amount of remuneration of Rs.35,000/- (including taxes) is approved for attending Board and its committees' meetings.

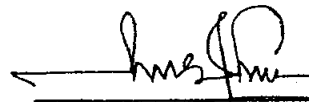
ACKNOWLEDGEMENT

17. The Board would like to place on record its appreciation to the workers, staff and management of the Company towards achieving results in general. The worker management relation remained excellent throughout the year, which resulted in the smooth operation of the Company. This is teamwork and we hope it will continue in the same atmosphere during the coming years.

Dated: 04 March, 2021



(ENGR. HAMMAD AMER HASHMI)
CHIEF EXECUTIVE OFFICER



(MUHAMMAD ASLAM SHEIKH)
DIRECTOR



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CENTRAL POWER GENERATION COMPANY LIMITED (GENCO-II)

☎ 0722 – 679088
☎ 0722 – 679085
✉ genco2_guddu@yahoo.com

CHIEF EXECUTIVE OFFICER

No. CPGCL/CEO/CCG/FY 19-20/256

Date: 04.03.2021

SCHEDULE-I

Statement of Compliance with the Public Sector Companies (Corporate Governance) Rules, 2013

Name of company **CENTRAL POWER GENERATION COMPANY LIMITED**

Name of the line ministry **Ministry of Energy (Power Division)**

For the year ended **June 30, 2020**

I. This statement presents the overview of the compliance with the Public Sector Companies (Corporate Governance) Rules, 2013 (hereinafter called "the Rules") issued for the purpose of establishing a framework of good governance, whereby a public sector company is managed in compliance with the best practices of public sector governance.

II. The Company has complied with the provisions of the Rules in the following manner:

S. No.	Provision of the Rules	Rule No.	Y	N																			
			Tick the relevant box																				
1.	The Independent Directors meet the criteria of independence, as defined under the Rules.	2(d)	✓																				
2.	The Board has at least one-third of its total members as Independent Directors. At present the Board includes:	3(2)	✓																				
	<table border="1"> <thead> <tr> <th>Category</th> <th>Names</th> <th>Date of Appointment</th> </tr> </thead> <tbody> <tr> <td rowspan="3">Independent Directors</td> <td>Syed Tahir Nawazish</td> <td>08/02/2019</td> </tr> <tr> <td>Mr. Abdul Qayum Malik</td> <td>08/02/2019</td> </tr> <tr> <td>Mr. Muhammad Aslam Shaikh</td> <td>08/02/2019</td> </tr> <tr> <td>Executive Directors</td> <td>Mr. Hammad Amer Hashmi</td> <td>08/02/2019</td> </tr> <tr> <td rowspan="3">Non-Executive Directors</td> <td>Dr. Arshad Mahmood</td> <td>21/02/2020</td> </tr> <tr> <td>Mr. Sajjad Ahmad</td> <td>13/09/2019</td> </tr> <tr> <td>Mr. Muhammad Imran</td> <td>08/02/2019</td> </tr> </tbody> </table>	Category	Names	Date of Appointment	Independent Directors	Syed Tahir Nawazish	08/02/2019	Mr. Abdul Qayum Malik	08/02/2019	Mr. Muhammad Aslam Shaikh	08/02/2019	Executive Directors	Mr. Hammad Amer Hashmi	08/02/2019	Non-Executive Directors	Dr. Arshad Mahmood	21/02/2020	Mr. Sajjad Ahmad	13/09/2019	Mr. Muhammad Imran	08/02/2019		
Category	Names	Date of Appointment																					
Independent Directors	Syed Tahir Nawazish	08/02/2019																					
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Non-Executive Directors	Dr. Arshad Mahmood	21/02/2020																					
	Mr. Sajjad Ahmad	13/09/2019																					
	Mr. Muhammad Imran	08/02/2019																					
3.	The Directors have confirmed that none of them is serving as a Director on more than five public sector companies and listed companies simultaneously, except their subsidiaries.	3(5)	✓																				
4.	The appointing authorities have applied the fit and proper criteria given in the Annexure to the Rules in making nominations of the persons for election as Board Members under the provisions of the Act.	3(7)	N/A	N/A																			
5.	The Chairman of the Board is working separately from the Chief Executive of the Company.	4(1)	✓																				
6.	The Chairman has been elected by the Board of Directors except where Chairman of the Board has been appointed by the Government.	4(4)	✓																				

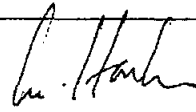
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S. No.	Provision of the Rules	Rule No.	Y	N
			Tick the relevant box	
7.	The Board has evaluated the candidates for the position of the Chief Executive on the basis of the fit and proper criteria as well as the guidelines specified by the Commission. (Not applicable where the Chief Executive has been nominated by the Government)	5(2)	✓	
8.	(a) The Company has prepared a "Code of Conduct" to ensure that professional standards and corporate values are in place. (b) The Board has ensured that appropriate steps have been taken to disseminate it throughout the company along with its supporting policies and procedures, including posting the same on the company's website. (c) The Board has set in place adequate systems and controls for the identification and redressal of grievances arising from unethical practices.	5(4)	✓ ✓	✓
9.	The Board has established a system of sound internal control, to ensure compliance with the fundamental principles of probity and propriety; objectivity, integrity and honesty; and relationship with the stakeholders, in the manner prescribed in the Rules.	5(5)	✓	
10.	The Board has developed and enforced an appropriate conflict of interest policy to lay down circumstances or considerations when a person may be deemed to have actual or potential conflict of interests, and the procedure for disclosing such interest.	5(5)(b)(ii)		✓
11.	The Board has developed and implemented a policy on anti-corruption to minimize actual or perceived corruption in the Company.	5(5)(b)(vi)		✓
12.	The Board has ensured equality of opportunity by establishing open and fair procedures for making appointments and for determining terms and conditions of service.	5(5)(c)(ii)	✓	
13.	The Board has ensured compliance with the law as well as the Company's internal rules and procedures relating to public procurement, tender regulations, and purchasing and technical standards, when dealing with suppliers of goods and services.	5(5)(c)(iii)	✓	
14.	The Board has developed a vision or mission statement and corporate strategy of the Company.	5(6)		✓
15.	The Board has developed significant policies of the Company. A complete record of particulars of significant policies along with the dates on which they were approved or amended, has been maintained.	5(7)	✓	
16.	The Board has quantified the outlay of any action in respect of any service delivered or goods sold by the Company as a public service obligation, and has submitted its request for appropriate compensation to the Government for consideration.	5(8)	N/A	N/A
17.	The Board has ensured compliance with policy directions requirements received from the Government.	5(11)	✓	
18.	(a) The Board has met at least four times during the year.	6(1)	✓	
	(b) Written notices of the Board meetings, along with agenda and working papers, were circulated at least seven days before the meetings.	6(2)	✓	
	(c) The minutes of the meetings were appropriately recorded and circulated.	6(3)	✓	

(57)

S. No.	Provision of the Rules	Rule No.	Tick the relevant box																			
			Y	N																		
19.	The Board has monitored and assessed the performance of senior management on annual/half-yearly/quarterly basis* and held them accountable for accomplishing objectives, goals and key performance indicators set for this purpose. * Strike out whichever is not applicable	8(2)		✓																		
20.	The Board has reviewed and approved the related party transactions placed before it after recommendations of the Audit Committee. A party wise record of transactions entered into with the related parties during the year has been maintained.	9	✓																			
21.	(a) The Board has approved the profit and loss account for, and balance sheet as at the end of, the first, second and third quarter of the year as well as the financial year end.	10		✓																		
	(b) In case of listed PSCs, the Board has prepared half yearly accounts and undertaken limited scope review by the Auditors.		N/A	N/A																		
	(c) The Board has placed the Annual Financial Statements on the Company's website.			✓																		
22.	All the Board members underwent an orientation course arranged by the Company to apprise them of the material developments and information as specified in the Rules.	11		✓																		
23.	(a) The Board has formed the requisite committees, as specified in the Rules.	12	✓																			
	(b) The committees were provided with written term of reference defining their duties, authority and composition.		✓																			
	(c) The minutes of the meetings of the committees were circulated to all the Board members.		✓																			
	(d) The committees were chaired by the following Non-executive Directors:		✓																			
	<table border="1"> <thead> <tr> <th>Committee</th> <th>Number of Members</th> <th>Name of Chair</th> </tr> </thead> <tbody> <tr> <td>Audit Committee</td> <td>4</td> <td>Mr. Muhammad Aslam Sheikh</td> </tr> <tr> <td>Risk Management Committee</td> <td>4</td> <td>Dr. Arshad Mahmood</td> </tr> <tr> <td>Human Resource Committee</td> <td>4</td> <td>Syed Tahir Nawazish</td> </tr> <tr> <td>Procurement Committee</td> <td>4</td> <td>Mr. Abdul Qayum Malik</td> </tr> <tr> <td>Nomination Committee</td> <td>4</td> <td>Syed Tahir Nawazish</td> </tr> </tbody> </table>		Committee	Number of Members	Name of Chair	Audit Committee	4	Mr. Muhammad Aslam Sheikh	Risk Management Committee	4	Dr. Arshad Mahmood	Human Resource Committee	4	Syed Tahir Nawazish	Procurement Committee	4	Mr. Abdul Qayum Malik	Nomination Committee	4	Syed Tahir Nawazish		
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Human Resource Committee	4	Syed Tahir Nawazish																				
Procurement Committee	4	Mr. Abdul Qayum Malik																				
Nomination Committee	4	Syed Tahir Nawazish																				
24.	The Board has approved appointment of Chief Financial Officer, Company Secretary and Chief Internal Auditor, by whatever name called, with their remuneration and terms and conditions of employment.	13	✓																			
25.	The Chief Financial Officer and the Company Secretary have requisite qualification prescribed in the Rules.	14	✓																			
26.	The Company has adopted International Financial Reporting Standards notified by the Commission in terms of sub-section (1) of section 225 of the Act.	16	✓																			
27.	The Directors' Report for this year has been prepared in compliance with the requirements of the Act and the Rules and fully describes the salient matters required to be disclosed.	17	✓																			
28.	The Directors, CEO and Executives, or their relatives, are not, directly	18	✓																			

S. No.	Provision of the Rules	Rule No.	Y	N															
			Tick the relevant box																
	or indirectly, concerned or interested in any contract or arrangement entered into by or on behalf of the Company except those disclosed to the Company.																		
29.	(a) A formal and transparent procedure for fixing the remuneration packages of Individual Directors has been set in place and no Director is involved in deciding his own remuneration.	19	✓																
	(b) The Annual Report of the Company contains criteria and details of remuneration of each Director.		✓																
30.	The financial statements of the Company were duly endorsed by the Chief Executive and Chief Financial Officer before consideration and approval of the Audit Committee and the Board.	20	✓																
31.	The Board has formed an Audit Committee, with defined and written terms of reference, and having the following members:	21	✓																
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">Name of member</th> <th style="width: 33%;">Category</th> <th style="width: 33%;">Professional Background</th> </tr> </thead> <tbody> <tr> <td>Mr. Muhammad Aslam Sheikh</td> <td>Independent Director</td> <td>B.E</td> </tr> <tr> <td>Dr. Arshad Mahmood</td> <td>Non-executive Director</td> <td>MBBS, M.Sc (Finance & Management)</td> </tr> <tr> <td>Mr. Sajjad Ahmad</td> <td>Non-executive Director</td> <td>M.A (Economics)</td> </tr> <tr> <td>Mr. Muhammad Imran</td> <td>Non-executive Director</td> <td>MBA, FCMA</td> </tr> </tbody> </table>		Name of member	Category	Professional Background	Mr. Muhammad Aslam Sheikh	Independent Director	B.E	Dr. Arshad Mahmood	Non-executive Director	MBBS, M.Sc (Finance & Management)	Mr. Sajjad Ahmad	Non-executive Director	M.A (Economics)	Mr. Muhammad Imran	Non-executive Director	MBA, FCMA		
	Name of member		Category	Professional Background															
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	Mr. Sajjad Ahmad		Non-executive Director	M.A (Economics)															
Mr. Muhammad Imran	Non-executive Director	MBA, FCMA																	
The Chief Executive and Chairman of the Board are not members of Audit Committee.	21(2)	✓																	
32.	(a) The Chief Financial Officer, the Chief Internal Auditor, and a representative of the External Auditors attended all meetings of the Audit Committee at which issues relating to accounts and audit were discussed.	21(3)	✓																
	(b) The Audit Committee met the External Auditors, at least once a year, without the presence of the Chief Financial Officer, the Chief Internal Auditor and other Executives.		✓																
	(c) The Audit Committee met the Chief Internal Auditor and other Members of the internal audit function, at least once a year, without the presence of Chief Financial Officer and the External Auditors.		✓																
33.	(a) The Board has set up an effective internal audit function, which has an Audit Charter, duly approved by the Audit Committee.	22	✓																
	(b) The Chief Internal Auditor has requisite qualification and experience prescribed in the Rules.		✓																
	(c) The internal audit reports have been provided to the External Auditors for their review.			✓															
34.	The External Auditors of the Company have confirmed that the firm and all its partners are in compliance with International Federation of Accountants (IFAC) guidelines on Code of Ethics as applicable in Pakistan.	23(4)	✓																
35.	The Auditors have confirmed that they have observed applicable guidelines issued by IFAC with regard to provision of non-audit services.	23(5)	✓																


HAMMAD AMER HASHMI
 CHIEF EXECUTIVE OFFICER


SYED TAHIR NAWAZISH
 CHAIRMAN



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CENTRAL POWER GENERATION COMPANY LIMITED
(GENCO-II)

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✉ genco2_guddu@yahoo.com

CHIEF EXECUTIVE OFFICER

No. CPGCL/CEO/CCG/FY 19-20/257

Date: 04.03.2021

SCHEDULE-II

**Explanation for Non-Compliance with the
Public Sector Companies (Corporate Governance) Rules, 2013**

We confirm that all other material requirements envisaged in the Rules have been complied with [except for the following, toward which reasonable progress is being made by the Company to seek compliance by the end of next accounting year]:

Sr. No.	Rule / sub-rule no.	Reasons for non-compliance	Future course of action
1	3(7)	Not applicable as the Ministry of Energy (Power Division), Government of Pakistan notifies the Board of Directors of the Company.	Not applicable.
2	5(4)	(b) Code of Conduct has not placed on the company's website because the company did not have any website.	Compliance will be ensured in future.
3	5(5)(b)(ii)	The Conflict of Interest Policy is not developed yet.	Compliance will be ensured in future.
4	5(5)(b)(vi)	As such, there is no separate Company's Policy on Anti-corruption, but being a Public Limited unlisted company wholly owned by the Government of Pakistan, all Government Entities are bound to strictly follow the rules & regulations of all anti-corruption departments / agencies of Government of Pakistan like FIA & NAB and etc.	Compliance will be ensured in future.
5	5(6)	The Board has not developed a vision or mission statement and corporate strategy of the Company yet.	Compliance will be ensured in future.
6	8(2)	Performance Evaluation Mechanism is under process.	Compliance will be ensured in future.
7	10	(a) The Board has not approved the profit and loss account for, and balance sheet as at the end of, the first, second and third quarters of the year. (c) Annual Financial Statements has not placed on the company's website because the company did not have any website.	Compliance will be ensured in future.
8	11	Orientation course was not held during the year.	Compliance will be ensured in future.
9	22	(c) Internal Audit Department was not completely functional.	Compliance will be ensured in future.

HAMMAD AMER HASHMI
CHIEF EXECUTIVE OFFICER

SYED TAHIR NAWAZISH
CHAIRMAN

(60)



EY Ford Rhodes
Chartered Accountants
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REVIEW REPORT TO THE MEMBERS ON THE STATEMENT OF COMPLIANCE WITH THE PUBLIC SECTOR COMPANIES (CORPORATE GOVERNANCE) RULES, 2013

We have reviewed the enclosed Statement of Compliance with the best practices contained in the Public Sector Companies (Corporate Governance) Rules, 2013 (the Rules) prepared by the Board of Directors of Central Power Generation Company Limited for the year ended 30 June 2020.

The responsibility for compliance with the Rules is that of the Board of Directors of the Company. Our responsibility is to review, to the extent where such compliance can be objectively verified, whether the Statement of Compliance reflects the status of the Company's compliance with the provisions of the Rules and report if it does not and to highlight any non-compliance with the requirements of the Rules. A review is limited primarily to inquiries of the Company's personnel and review of various documents prepared by the Company to comply with the Rules.

As a part of our audit of the financial statements we are required to obtain an understanding of the accounting and internal control systems sufficient to plan the audit and develop an effective audit approach. We are not required to consider whether the Board of Directors' statement on internal control covers all risks and controls or to form an opinion on the effectiveness of such internal controls, the Company's corporate governance procedures and risks.

The Rules requires the Company to place before the Audit Committee, and upon recommendation of the Audit Committee, place before the Board of Directors for their review and approval of its related party transactions distinguishing between transactions carried out on terms equivalent to those that prevail in arm's length transactions and transactions which are not executed at arm's length price and recording proper justification for using such alternate pricing mechanism. We are only required and have ensured compliance of this requirement to the extent of the approval of the related party transactions by the Board of Directors upon recommendation of the Audit Committee. We have not carried out any procedures to determine whether the related party transactions were undertaken at arm's length price or not.

Based on our review, nothing has come to our attention which causes us to believe that the 'Statement of Compliance' does not appropriately reflect the Company's compliance, in all material respects, with the best practices contained in the Rules as applicable to the Company for the year ended 30 June 2020.

Chartered Accountants
Engagement Partner: Sajjad Hussain Gill
Lahore: 18 March 2021

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INDEPENDENT AUDITOR'S REPORT

To the members of Central Power Generation Company Limited

Report on the audit of the financial statements

Qualified Opinion

We have audited the annexed financial statements of **Central Power Generation Company Limited** (the Company), which comprise the statement of financial position as at 30 June 2020, and the statement of profit or loss, the statement of comprehensive income, the statement of changes in equity, the statement of cash flows for the year then ended, and notes to the financial statements, including a summary of significant accounting policies and other explanatory information, and we state that we have obtained all the information and explanations which, to the best of our knowledge and belief, were necessary for the purposes of the audit.

In our opinion and to the best of our information and according to the explanations given to us, except for the effects of the matter described in the Basis for Qualified Opinion section of our report, the statement of financial position, statement of profit or loss, statement of comprehensive income, the statement of changes in equity and the statement of cash flows together with the notes forming part thereof conform with the accounting and reporting standards as applicable in Pakistan and give the information required by the Companies Act, 2017 (XIX of 2017), in the manner so required and, except for the effects of the matter described in the Basis for Qualified Opinion section of our report, respectively give a true and fair view of the state of the Company's affairs as at 30 June 2020 and of the profit and total comprehensive income, the changes in equity and its cash flows for the year then ended.

Basis for Qualified Opinion

As disclosed in Note 22.1.3 to the financial statements, the Company has not recognized a liability for its obligation to pay Interest / Late Payment Surcharge (LPS) on late payments for the natural gas supplied by Mari Petroleum Company Limited (MPCL) and Pakistan Petroleum Limited (PPL) under the signed gas sales term sheet and gas sale agreements, respectively. Further, as explained in the aforementioned note, the Company has claimed LPS from Central Power Purchasing Agency (Guarantee) Limited (CPPA-G) due to delayed payments by CPPA - G relating to supply of electricity, which has also not been recognized as receivable.

Had the Company recognized the LPS expense under the gas sales term sheet / gas sale agreements with MCL and PPL, and LPS income from the CPPA-G, the Company's trade and other payable, trade debts and tax refunds due from the Government as at 30 June 2020 would have been higher by Rs. 22,089,808 thousand, Rs. 18,062,870 thousand and Rs. 1,213,015 thousand respectively, and accumulated losses as at 30 June 2019 would be higher by Rs. 3,201,484 thousand, finance cost, finance income and taxation for the year ended 30 June 2020 would have been higher by Rs. 6,628,555 thousand, Rs. 7,174,415 thousand and Rs. 158,300 thousand respectively and accordingly, profit after tax for the year ended 30 June 2020 would have been higher by Rs. 387,560 thousand.

We conducted our audit in accordance with International Standards on Auditing (ISAs) as applicable in Pakistan. Our responsibilities under those standards are further described in the Auditors' Responsibilities for the Audit of the Financial Statements section of our report. We are independent of the Company in accordance with the International Ethics Standards Board for Accountants' Code of Ethics for Professional Accountants as adopted by the Institute of Chartered Accountants of Pakistan (the Code) and we have fulfilled our other ethical responsibilities in accordance with the Code. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our qualified opinion.

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Information Other than the Financial Statements and Auditors' Report Thereon

Management is responsible for the other information. The other information comprises the information included in the Directors' Report, but does not include the financial statements and our auditors' report thereon.

Our opinion on the financial statements does not cover the other information and we do not express any form of assurance conclusion thereon.

In connection with our audit of the financial statements, our responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the financial statements or our knowledge obtained in the audit or otherwise appears to be materially misstated. If, based on the work we have performed, we conclude that there is a material misstatement of this other information, we are required to report that fact. As described in the Basis for Qualified Opinion section above, the Company has not recognized a liability for its obligation to pay interest / LPS on late payments for the natural gas supplied by MPCL and PPL under the signed gas sales term sheet and gas sale agreements, respectively. Further, the Company has claimed LPS from CPPA-G due to delayed payments by CPPA - G relating to supply of electricity, which has also not been recognized as receivable. We have concluded that the other information is materially misstated with respect to the amounts or other items as described in the Basis for Qualified Opinion section above.

Responsibilities of Management and Board of Directors for the Financial Statements

Management is responsible for the preparation and fair presentation of the financial statements in accordance with the accounting and reporting standards as applicable in Pakistan and the requirements of Companies Act, 2017 (XIX of 2017) and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is responsible for assessing the Company's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Company or to cease operations, or has no realistic alternative but to do so.

Board of Directors are responsible for overseeing the Company's financial reporting process.

Auditor's Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditors' report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with ISAs as applicable in Pakistan will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

As part of an audit in accordance with ISAs as applicable in Pakistan, we exercise professional judgment and maintain professional scepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.

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- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Company's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditors' report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditors' report. However, future events or conditions may cause the Company to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

We communicate with the Board of Directors regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

Report on Other Legal and Regulatory Requirements

Based on our audit, we further report that in our opinion:

- a) except for the effects of the matter described in the basis for qualified opinion section of our report, proper books of account have been kept by the Company as required by the Companies Act, 2017 (XIX of 2017);
- b) except for the effects of the matter described in the basis for qualified opinion section of our report, the statement of financial position, the statement of profit or loss, the statement of comprehensive income, the statement of changes in equity and the statement of cash flows together with the notes thereon have been drawn up in conformity with the Companies Act, 2017 (XIX of 2017) and are in agreement with the books of account and returns;
- c) investments made, expenditure incurred and guarantees extended during the year were for the purpose of the Company's business; and
- d) no zakat was deductible at source under the Zakat and Ushr Ordinance, 1980 (XVIII of 1980).

The engagement partner on the audit resulting in this independent auditors' report is Sajjad Hussain Gill.

Chartered Accountants
Place: Lahore
Date: 18 March 2021

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CENTRAL POWER GENERATION COMPANY LIMITED
STATEMENT OF FINANCIAL POSITION
AS AT 30 JUNE 2020

<u>ASSETS</u>	Note	2020 -----Rupees in thousands-----	2019
Non-current assets			
Property, plant and equipment	5	101,901,574	105,871,790
Long term advances	6	51,655	49,159
Long term deposits		281	281
		<u>101,953,510</u>	<u>105,921,230</u>
Current assets			
Stores, spare parts and loose tools	7	3,633,585	2,331,233
Stock-in-trade	8	928,352	928,352
Trade debt	9	68,273,192	54,184,461
Advances, loan and prepayments	10	1,029,902	3,434,548
Other receivables	11	1,003,410	1,021,618
Tax refunds due from the Government	12	4,262,523	4,002,824
Bank balances	13	10,166,613	6,105,556
		<u>89,297,577</u>	<u>72,008,592</u>
TOTAL ASSETS		<u><u>191,251,087</u></u>	<u><u>177,929,822</u></u>
<u>EQUITY AND LIABILITIES</u>			
SHARE CAPITAL AND RESERVES			
Share Capital			
Authorized share capital			
5,000,000,000 (2019: 5,000,000,000) ordinary shares of Rs.10 each		<u>50,000,000</u>	<u>50,000,000</u>
Issued, subscribed and paid-up share capital	14	500	500
Accumulated losses		<u>(4,762,709)</u>	<u>(5,618,281)</u>
		<u>(4,762,209)</u>	<u>(5,617,781)</u>
Deposit for shares	15	3,343,919	3,343,919
		<u>(1,418,290)</u>	<u>(2,273,862)</u>
Non-current liabilities			
Long term financing	16	37,666,958	45,568,309
Deferred taxation - net	17	2,309,764	994,316
Deferred grant	18	198,591	397,181
Staff retirement benefits	19	30,901,085	27,428,124
		<u>71,076,398</u>	<u>74,387,930</u>
Current liabilities			
Trade and other payables	20	104,460,640	89,955,483
Interest accrued on long term financing	21	7,485,515	6,622,705
Current portion of long term financing	16	9,646,824	9,237,566
		<u>121,592,979</u>	<u>105,815,754</u>
		<u><u>191,251,087</u></u>	<u><u>177,929,822</u></u>

CONTINGENCIES AND COMMITMENTS


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The annexed notes from 1 to 39 form an integral part of these financial statements.

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CHIEF EXECUTIVE



DIRECTOR

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CENTRAL POWER GENERATION COMPANY LIMITED
STATEMENT OF PROFIT OR LOSS
FOR THE YEAR ENDED 30 JUNE 2020

		2020	2019
	Note	----Rupees in thousands----	
Revenue from contract with customer - net	23	68,405,062	78,735,612
Cost of revenue	24	<u>(61,780,426)</u>	<u>(68,561,713)</u>
Gross profit		6,624,636	10,173,899
Administrative expenses	25	<u>(979,445)</u>	<u>(1,493,054)</u>
Operating profit		5,645,191	8,680,845
Other income	26	530,563	487,189
Finance costs	27	<u>(3,033,294)</u>	<u>(4,173,593)</u>
Profit before taxation		3,142,460	4,994,441
Taxation	28	<u>(1,932,924)</u>	<u>(1,477,599)</u>
Profit for the year		<u>1,209,536</u>	<u>3,516,842</u>

The annexed notes from 1 to 39 form an integral part of these financial statements.

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CHIEF EXECUTIVE



DIRECTOR

CENTRAL POWER GENERATION COMPANY LIMITED
STATEMENT OF COMPREHENSIVE INCOME
FOR THE YEAR ENDED 30 JUNE 2020

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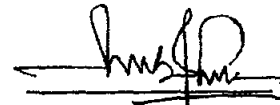
	2020	2019
Note	----Rupees in thousands----	
Profit for the year	1,209,536	3,516,842
Other comprehensive income:		
<i>Items not to be reclassified to profit or loss in subsequent periods:</i>		
Re-measurement loss on defined benefit plans	19.3 (498,541)	(1,909,683)
Related tax effects	144,577	324,646
Other comprehensive loss for the year - net of tax	(353,964)	(1,585,037)
Total comprehensive income for the year	855,572	1,931,805

The annexed notes from 1 to 39 form an integral part of these financial statements.

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CHIEF EXECUTIVE



DIRECTOR


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CENTRAL POWER GENERATION COMPANY LIMITED
STATEMENT OF CASH FLOWS
FOR THE YEAR ENDED 30 JUNE 2020

Note	2020 —Rupees in thousands—	2019
CASH FLOWS FROM OPERATING ACTIVITIES		
Profit before taxation	3,142,460	4,994,441
Adjustments to reconcile profit before tax to net cash flows:		
Depreciation	5,713,922	4,887,505
Amortization of deferred grant	(198,590)	(198,590)
Provision for staff benefits - net	4,111,237	2,682,282
Profit on bank deposits	(273,556)	(140,123)
Finance cost	3,033,294	3,354,619
Exchange loss	-	818,974
Reversal of NRV adjustment on stock in trade	-	(58,164)
	<u>12,386,307</u>	<u>11,346,503</u>
Cash flows before working capital changes	15,528,767	16,340,944
(Increase) / decrease in current assets:		
Stores, spare parts and loose tools	(1,302,352)	(246,487)
Stock-in-trade	-	273
Trade debt	(14,088,731)	(41,193,784)
Advances	2,404,646	(1,714,089)
Other receivables	18,208	(23,187)
Tax refunds due from the Government	(732,598)	(29,427)
	<u>(13,700,827)</u>	<u>(43,206,701)</u>
Increase in current liabilities:		
Trade and other payables	14,478,737	39,591,511
Cash generated from operations	16,306,677	12,725,754
Finance cost paid	(2,148,386)	(2,024,415)
Staff benefits paid	(1,136,817)	(885,208)
	<u>(3,285,203)</u>	<u>(2,909,623)</u>
Net cash generated from operating activities	13,021,474	9,816,131
CASH FLOWS FROM INVESTING ACTIVITIES		
Capital expenditure - net	(1,076,885)	(229,229)
Increase in long term advances	(2,496)	(152)
Profit on bank deposits received	273,556	140,123
Net cash used in investing activities	(805,825)	(89,258)
CASH FLOWS FROM FINANCING ACTIVITIES		
Repayment long-term financing - net	(8,154,592)	(6,908,184)
Net increase in cash and cash equivalents	4,061,057	2,818,689
Cash and cash equivalents at the beginning of the year	6,105,556	3,286,867
Cash and cash equivalents at the end of the year	<u>10,166,613</u>	<u>6,105,556</u>
NON-CASH INVESTING ACTIVITIES		
Capitalization of exchange loss	(666,821)	(14,328,740)

The annexed notes from 1 to 39 form an integral part of these financial statements.

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CHIEF EXECUTIVE



DIRECTOR

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CENTRAL POWER GENERATION COMPANY LIMITED
STATEMENT OF CHANGES IN EQUITY
FOR THE YEAR ENDED 30 JUNE 2020

	Share capital	Revenue Reserve - Accumulated losses	Total
Note	----- Rupees in thousands -----		
Balance as at 01 July 2018	500	(7,550,086)	(7,549,586)
Profit for the year	-	3,516,842	3,516,842
Other comprehensive loss for the year	-	(1,585,037)	(1,585,037)
Total comprehensive income for the year	-	1,931,805	1,931,805
Balance as at 30 June 2019	500	(5,618,281)	(5,617,781)
Profit for the year	-	1,209,536	1,209,536
Other comprehensive loss for the year	-	(353,964)	(353,964)
Total comprehensive income for the year	-	855,572	855,572
Balance as at 30 June 2020	500	(4,762,709)	(4,762,209)

The annexed notes from 1 to 39 form an integral part of these financial statements.

5



CHIEF EXECUTIVE



DIRECTOR

CENTRAL POWER GENERATION COMPANY LIMITED
NOTES TO THE FINANCIAL STATEMENTS
FOR THE YEAR ENDED 30 JUNE 2020

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1 THE COMPANY AND ITS ACTIVITIES

1.1 Central Power Generation Company Limited (the Company) was incorporated on 26 October 1998 as a public limited company under the Companies Act, 2017, with its registered office situated at 185, WAPDA House, Shahrah-e-Quaid-e-Azam, Lahore. The Company was formed to acquire all the properties, assets and liabilities of Thermal Power Station (TPS) Guddu, TPS Sukkur and TPS Quetta from Water And Power Development Authority (WAPDA). The Company's main objective is the generation and sale of electricity.

1.2 Business transfer agreement

The Company took over certain properties, assets, rights, obligations and liabilities relating to generation of electricity from WAPDA under a Business Transfer Agreement (BTA) dated 02 March 1999. The details of assets, liabilities and related matters as provided under clause 1.1 of the BTA have been finalized with WAPDA through a Supplementary Business Transfer Agreement (SBTA). However, according to clause 10-A(iii) of SBTA, the BTA will be effective upon execution of agreements relating to the loans / liabilities assumed by the Company as a consequence of the BTA, which is still in process.

1.3 Geographical location of head office and business units

- The head office of the Company is situated at TPS Guddu, District Kashmore, Sindh.
- The location, installed capacity, operational status and generation license granted by National Electric Power Regulatory Authority (NEPRA) under section 15 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997, through license no. GL/02/2002 dated 01 July 2002 and subsequently through modification dated 10 July 2019 of the power plants of the Company are as follows:

Thermal Power Stations (TPS)	Block	Installed capacity (MW)	Status	Generation licence upto
	Block I	415.00	Operational	2024
	Block II	600.00	Operational	2023
TPS Guddu	Block III	420.00	Non-operational	-
	Block IV	220.00	Non-operational	-
	Block V	776.70	Operational	2042
TPS Sukkur	-	50.00	Non-operational	-
TPS Quetta	-	50.94	Non-operational	2029
		<u>2,532.64</u>		

1.4 Impact of COVID-19 on the financial statements

The World Health Organization declared COVID-19 a global pandemic on 11 March 2020. Accordingly, on 20 March 2020, the Government of Pakistan announced temporary lock down as a measure to reduce the spread of COVID-19. The outbreak of COVID-19 has had a distressing impact on overall demand in the global economy with notable downgrade in growth forecasts.

The Company's management is fully cognizant of the business challenges posed by the COVID-19 outbreak and closely monitoring the possible impacts on the Company's operations and liquidity positions and believes that its current policies for managing credit, liquidity and market risk are adequate in response to current situation.

Further, subsequent to year end, the situation is improved with the easing of lock down and re-opening of the businesses.

The management has assessed the impact of the COVID-19 on the financial statements and concluded that there is no material financial impact of COVID-19 on the carrying amounts of assets, liabilities, income or expenses which required specific disclosures.

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CENTRAL POWER GENERATION COMPANY LIMITED

2. STATEMENT OF COMPLIANCE

These financial statements have been prepared in accordance with the accounting and reporting standards as applicable in Pakistan. The accounting and reporting standards applicable in Pakistan comprise of:

- International Financial Reporting Standards (IFRSs) issued by the International Accounting Standards Board (IASB) as notified under the Companies Act, 2017;
- Provisions of and directives issued under the Companies Act, 2017.

Where provisions of and directives issued under the Act, differ from the IFRSs, the provisions of and directives issued under the Companies Act, 2017 have been followed.

Securities and Exchange Commission of Pakistan's (SECP) through its S.R.O. no.24(I)/2012 dated January 16, 2012 and S.R.O 986(I)/2019, dated September 02, 2019, has granted exemption from requirements of International Financial Reporting Standards ("IFRS") to all companies that have executed their power purchase agreements before 01 January 2019, as follows:

- a) IFRS 16 (Leases) to the extent of the power purchase agreements executed before the effective date of IFRS 16 i.e. 01 January 2019;
- b) International Accounting Standard 21 (The Effects of Changes in Foreign Exchange Rates) to the extent of capitalization of exchange differences; and
- c) In case of capitalization of exchange differences under (b) above, recognition of embedded derivative under IFRS 9 (Financial Instruments) shall not be permitted.

Related disclosures applicable due to departure of above IFRS requirements are stated in Note 34 and 35 to the financial statements.

3. BASIS OF MEASUREMENT

3.1 Accounting convention

These financial statements have been prepared under the historical cost convention unless other wise stated.

3.2 Functional and presentation currency

These financial statements are presented in Pak Rupee which is the Company's functional currency. Amounts presented in the financial statements have been rounded off to the nearest thousand of Rupees, unless otherwise stated.

3.2 Significant accounting estimates and judgments

The preparation of financial statements in conformity with approved accounting standard requires the use of certain critical accounting estimates. It also requires management to exercise its judgment in the application of Company's accounting policies. Estimates and judgments are continually evaluated and are based on historical experiences, including expectations of future events that are believed to be reasonable under the circumstances. The areas involving a higher degree of judgment or complexity or areas where assumptions and estimates are significant to the financial statements are documented in the following accounting policies and notes, and relate primarily to:

	Note
a) Useful life and depreciation method of fixed assets	4.2 & 5
b) Provision against obsolete / slow moving inventories	4.3, 7 & 8
c) Obligation of defined benefit obligation	4.10 & 19
d) Current income tax expense, provision for current tax and recognition of deferred tax asset (for carried forward tax losses)	4.15, 12, 17 & 28
e) Provisions	4.17
d) Revenue from contract with customer	4.11 & 23

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4. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

4.1 Standards, interpretations and amendments to published approved accounting standards those are effective in current year

The accounting policies adopted in the preparation of these financial statements are consistent with those of the previous financial year except as described below:

IFRS 16 – Leases

IAS 19 - Plan Amendment, Curtailment or Settlement (Amendments)

IAS 28 - Long-term Interests in Associates and Joint Ventures – (Amendments)

IFRIC 23 - Uncertainty over Income Tax Treatments

IFRS 3 - Business Combinations - Previously held Interests in joint operation - (Amendments)

IFRS 11 - Joint Arrangements - Previously held interests in a joint operation - (AIP)

IAS 23 - Borrowing Costs - Borrowing costs eligible for capitalization

IFRS 9 - Prepayment Features with Negative Compensation - (Amendments)

IAS 12 - Income Taxes - Income tax consequences of payments on financial instruments classified as equity

IFRS - 14 - Regulatory Deferral Accounts

The adoption of the above standards, amendments, improvements to accounting standards and interpretations did not have any material impact on the financial statements except for IFRS 16. However, the Company has availed the exemption granted by SECP as described in Note 2 to the financial statements.

4.2 Property, plant and equipment

a) Cost

Items of property, plant and equipment are stated at cost less accumulated depreciation and impairment loss, if any, except for freehold land, which is stated at cost. Cost of operating fixed assets comprises historical cost and other expenditure pertaining to the acquisition, construction, erection and installation of these assets.

Subsequent costs are included in the asset's carrying amount or recognized as a separate asset, as appropriate, only when it is probable that future economic benefits associated with the item will flow to the Company and the cost of the item can be measured reliably. Major overhauling and improvements are capitalized, while all other repair and maintenance costs are charged to statement of profit or loss during the year in which they are incurred.

Further, as described in Note 4:19 to the financial statements, exchange gains and losses on long term foreign currency loans utilized for acquisition of assets are added to/deducted from cost of property, plant and equipment.

b) Depreciation

Depreciation on property, plant and equipment is charged to statement of profit or loss on straight line method so as to write off the carrying amount of an asset over its estimated useful life at the rates given in Note 5.1 to the financial statements. Depreciation charge commences from the month in which asset is available for use and no depreciation is charged in the month of disposal.

Spare parts and servicing equipment are classified as property, plant and equipment under plant and machinery rather than stores, spare parts and loose tools when they meet the definition of property, plant and equipment. Available for use capital spares and servicing equipment are depreciated over their useful lives, or the remaining life of principal asset, whichever is lower.

Judgment and estimates

The useful lives, residual values and depreciation method are reviewed on a regular basis. The effect of any changes in estimate is accounted for on a prospective basis.

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c) Derecognition

An item of property, plant and equipment is derecognized upon disposal or when no future economic benefits are expected from its use or disposal. Any gain or loss arising on derecognition of the asset (calculated as the difference between the net disposal proceeds and carrying amount of the asset) is included in the statement of profit or loss in the year during which the asset is derecognized.

d) Impairment of assets

The Company assesses at each statement of financial position date whether there is any indication that assets excluding inventory may be impaired. In making these assessment, the Company uses the technical resources available inside/outside the Company, as appropriate. If such indication exists, the carrying amounts of such assets are reviewed to assess whether they are recorded in excess of their recoverable amounts. Where the carrying value exceeds the recoverable amount, assets are written down to the recoverable amount and the difference is charged to the statement of profit or loss.

e) Capital work-in-progress

Capital work-in-progress represents expenditure on property, plant and equipment which are in the course of construction and installation. Transfers are made to relevant property, plant and equipment category as and when assets are available for use.

Capital work-in-progress is stated at cost less any identified impairment loss.

4.3 Inventories

a) Stores, spares parts and loose tools

These are valued at lower of cost, determined on weighted average basis, and net realizable value. Cost represents the invoice values directly attributable thereon. Provision is made for obsolete and slow moving items, if any.

Net realizable value is the estimated selling price in the ordinary course of business, less estimated costs of completion and the estimated costs necessary to make the sale.

b) Stock-in-trade

Stock-in-trade are valued at lower of cost, determined on weighted average basis, and net realizable value.

Materials-in-transit are stated at cost. Cost of items-in-transit represents the invoice value plus other charges incurred thereon till the reporting date.

Net realizable value signifies the estimated selling price in the ordinary course of business less cost necessary to make the sale. Provision is made for obsolete stock-in-trade, if any.

Judgment and estimates

Inventory write-down is made based on the current market conditions, historical experience and selling goods of similar nature. It could change significantly as a result of changes in market conditions. A review is made on each reporting date for excess inventories, obsolescence and declines in net realizable value and a provision is recorded against the inventory balances for any such declines.

4.4 Trade debts

Trade debts are initially measured at their transaction price under IFRS 15 and subsequently measured at amortized cost less any allowance for expected credit losses.

4.5 Cash and cash equivalents

Cash and cash equivalents are carried at amortized cost and comprise cash at banks in current and deposit

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4.6 Loan, advances and other receivables

Advances are recognized at cost, which is the fair value of the consideration given. However, an assessment is made at each reporting date to determine whether there is an indication that an advance may be impaired. If such an indication exists, the estimated recoverable amount of that asset is determined and an impairment loss is recognized for the difference between the recoverable amount and the carrying value.

Further, as disclosed in Note 4.12 to the financial statements, loan to related party and other receivables are recognized at amortized cost and being receivable from government owned entities, no ECL is recognized on them.

4.7 Government grants

Grants are recognized where there is reasonable assurance that the grant will be received and all attached conditions will be complied with. When the grant relates to an expense item, it is recognized as income over the period necessary to match the grant on a systematic basis to the costs that it is intended to compensate. When the grant relates to an asset, it is recognized as deferred grant and released to income in equal amounts over the expected useful life of the related asset.

4.10 Staff retirement benefit and other long-term benefits

The main features of the schemes operated by the Company for its employees are as follows:

a) Defined benefit plans

The Company operates unfunded pension, post retirement free electricity and medical benefits schemes for all its permanent employees. Provisions are made, annually, to cover obligations under these schemes, by way of a charge to statement of profit or loss, calculated in accordance with the actuarial valuation. The most recent valuation in this regard was carried out as at 30 June 2020, using the Projected Unit Credit Method. All re-measurement gains and losses are recognized in 'Other Comprehensive Income net of deferred tax' as they occur.

b) Accumulating compensated absences

The employees of the Company are entitled to accumulating compensated absences, which are encashable at the time of retirement up to a maximum limit of 365 days. Actuarial gains and losses on long-term compensated absences are recognized in statement of profit or loss.

c) Other benefits

For General Provident Fund and WAPDA Welfare Fund, the Company makes deduction from salaries of the employees and remits these amounts to the funds established by WAPDA.

As the General Provident Fund and WAPDA welfare fund are maintained by WAPDA on behalf of the Company, therefore relevant disclosures required under Section 218 and Fifth Schedule of the Companies Act 2017 are not applicable on the Company.

Judgement and estimates

The Company has made certain actuarial assumption as disclosed in Note 19.4 to the financial statements for valuation of present value of defined benefit plans and accumulating compensated absences.

4.11 Revenue from contract with customer

The Company is engaged in the business of generation of electricity. The Company signed its Power Purchase Agreement (PPA) with Central Power Purchasing Agency (Guarantee) Limited (CPPA-G), the sole customer of Company. In accordance with the PPA, the Company has assessed the following performance obligations:

- Making capacity available; and
- Delivering Net Electrical Output (NEO).

The Company has generally concluded that it is the principal in all of its revenue arrangements.

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Judgment and estimates

The Company uses significant judgement and estimates in recognition of revenue from customer as follows:

a) Estimating transaction price

Energy and capacity charges are recognized at the tariff approved by the National Electric Power Regulatory Authority (NEPRA) under the mechanism laid down in the PPA. The Company has applied the practical expedient of recognizing revenue in the amount to which the Company has a right to invoice, being a right to consideration from CPPA-G in an amount that corresponds directly with the value to the CPPA-G, of the entity's performance completed to date.

The amount of revenue recognized in respect of sale of electricity includes the estimates of variable consideration when it is highly probable that a significant reversal in the amount of cumulative revenue recognized will not occur in future or when the uncertainty associated with the variable consideration is subsequently resolved. There is no significant financing component attached to the receivables from the customer.

b) Determination of timing of satisfaction of performance obligation

Revenue for:

- Sale of electricity to the CPPA-G (energy charges) is recognized when the Company satisfies performance obligation by delivering NEO to CPPA-G; and
- Capacity of the plant (capacity charges) is recognized when due, using the 'performance obligation satisfied over time' approach under IFRS 15 as the customer simultaneously receives and consumes the benefits provided by the Company's performance.

The energy and capacity charges are billed on monthly basis in arrears and in advance accordingly, in accordance with terms of PPA and have a credit period of 30 days.

4.12 Financial assets**a) Initial recognition and measurement**

Financial assets are classified, at initial recognition, as subsequently measured at amortized cost, fair value through other comprehensive income (OCI), and fair value through profit or loss.

The classification of financial assets at initial recognition depends on the financial asset's contractual cash flow characteristics and the Company's business model for managing them. With the exception of trade receivables that do not contain a significant financing component or for which the Company has applied the practical expedient, the Company initially measures a financial asset at its fair value plus, in the case of a financial asset not at fair value through profit or loss, transaction costs.

Trade receivables that do not contain a significant financing component or for which the Company has applied the practical expedient are measured at the transaction price as disclosed in Note 4.11 to the financial statements.

In order for a financial asset to be classified and measured at amortized cost or fair value through OCI, it needs to give rise to cash flows that are 'solely payments of principal and interest (SPPI)' on the principal amount outstanding. This assessment is referred to as the SPPI test and is performed at an instrument level. Financial assets with cash flows that are not SPPI are classified and measured at fair value through profit or loss, irrespective of the business model.

The Company's financial assets which includes bank balances, trade debt, long term deposits, loan to related party and other receivables, are recorded at amortized cost.

b) Subsequent measurement

The Company subsequently measures financial assets at amortized cost using the effective interest rate (EIR) method and are subject to impairment. Gains and losses are recognized in profit or loss when the asset is derecognized, modified or impaired.

c) Derecognition

A financial asset (or, where applicable, a part of a financial asset or part of a group of similar financial assets) is primarily derecognized (i.e., removed from the statement of financial position) when:

- The rights to receive cash flows from the asset have expired; or

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- The Company has transferred its rights to receive cash flows from the asset or has assumed an obligation to pay the received cash flows in full without material delay to a third party under a 'pass-through' arrangement; and either (a) the Company has transferred substantially all the risks and rewards of the asset, or (b) the Company has neither transferred nor retained substantially all the risks and rewards of the asset, but has transferred control of the asset.

When the Company has transferred its rights to receive cash flows from an asset or has entered into a pass-through arrangement, it evaluates if, and to what extent, it has retained the risks and rewards of ownership. When it has neither transferred nor retained substantially all of the risks and rewards of the asset, nor transferred control of the asset, the Company continues to recognize the transferred asset to the extent of its continuing involvement. In that case, the Company also recognizes an associated liability. The transferred asset and the associated liability are measured on a basis that reflects the rights and obligations that the Company has retained.

Continuing involvement that takes the form of a guarantee over the transferred asset is measured at the lower of the original carrying amount of the asset and the maximum amount of consideration that the Company could be required to repay.

d) Impairment

The Company recognizes an allowance for expected credit losses (ECLs) for all debt instruments not held at fair value through profit or loss. ECLs are based on the difference between the contractual cash flows due in accordance with the contract and all the cash flows that the Company expects to receive, discounted at an approximation of the original effective interest rate. The expected cash flows will include cash flows from the sale of collateral held or other credit enhancements that are integral to the contractual terms.

ECLs are recognized in two stages. For credit exposures for which there has not been a significant increase in credit risk since initial recognition, ECLs are provided for credit losses that result from default events that are possible within the next 12-months (a 12-month ECL). For those credit exposures for which there has been a significant increase in credit risk since initial recognition, a loss allowance is required for credit losses expected over the remaining life of the exposure, irrespective of the timing of the default (a lifetime ECL).

SECP, through its S.R.O no. 985(I)/2019, dated 02 September 2019, has exempted the requirements contained in IFRS-9 (Financial Instruments) related to application of Expected Credit Losses method till 30 June 2021, in respect of financial assets due or ultimately due from the Government of Pakistan (GOP). The major financial assets of the Company include trade debt, loan and long term deposits from GOP or GOP owned entities. Accordingly, the Company has not recorded ECL against these financial assets. The impairment under IFRS 9 on financial assets other than these assets is insignificant and accordingly has not been incorporated in the financial statements.

4.13 Financial liabilities

a) Initial recognition and measurement

Financial liabilities are classified, at initial recognition, as financial liabilities at fair value through profit or loss, loans and borrowings, payables as appropriate.

All financial liabilities are recognized initially at fair value and, in the case of loans and borrowings and payables, net of directly attributable transaction costs.

The Company's financial liabilities include trade and other payables, long-term financing and interest accrued on long-term financing.

b) Subsequent measurement

After initial recognition, interest-bearing loans and borrowings are subsequently measured at amortized cost using the EIR method. Gains and losses are recognized in profit or loss when the liabilities are derecognized as well as through the EIR amortization process.

Amortized cost is calculated by taking into account any discount or premium on acquisition and fees or costs that are an integral part of the EIR. The EIR amortization is included as finance costs in the statement of profit or loss.

Further, the Company does not have any financial liability classified at fair value through profit and loss.

c) Derecognition

A financial liability is derecognized when the obligation under the liability is discharged or cancelled or expires. When an existing financial liability is replaced by another from the same lender on substantially different terms, or the terms of an existing liability are substantially modified, such an exchange or modification is treated as the derecognition of the original liability and the recognition of a new liability. The difference in the respective carrying amounts is recognized in the statement of profit or loss.

4.14 Offsetting of financial instruments

Financial assets and financial liabilities are offset, and the net amount is reported in the statement of financial position if there is a currently enforceable legal right to offset the recognized amounts and there is an intention to settle on a net basis, to realize the assets and settle the liabilities simultaneously.

4.15 Taxation**a) Income tax**

The income tax expense or credit for the period is the tax payable on the current period's taxable income based on the applicable income tax rate for each jurisdiction adjusted by changes in deferred tax assets and liabilities attributable to temporary differences and to unused tax losses. The charge for income tax also includes adjustments, where considered necessary, to provision for tax made in previous years arising from assessments framed during the year for such years.

i) Current tax

Current income tax assets and liabilities are measured at the amount expected to be recovered from or paid to the taxation authorities. The tax rates and tax laws used to compute the amount are those that are enacted or substantively enacted at the reporting date. The Company takes benefit of any tax credit and rebate.

Under Power Purchase Agreement (PPA), dated 20 September 2015, with Central Power Purchasing Agency (Guarantee) Limited (CPPA-G), the Company can pass on the impact of any income tax paid to CPPA-G. In 2017, the Company filed a petition with NEPRA on 21 June 2017, for revision of tariff to incorporate the effect of the income tax paid by the Company. The management of the Company intends to recognize the resultant revenue, upon notification of new tariff, as a matter of prudence.

ii) Deferred tax

Deferred tax is provided in full, using the liability method, on temporary differences arising between the tax bases of assets and liabilities and their carrying amounts in the financial statements. Deferred income tax is determined using tax rates (and laws) that have been enacted or substantively enacted by the end of the reporting period and are expected to apply when the related deferred income tax asset is realized, or the deferred income tax liability is settled.

Deferred tax assets are recognized for deductible temporary differences and unused tax losses and credits only if it is probable that future taxable amounts will be available to utilize those temporary differences and unused tax losses and credits.

Current and deferred tax is recognized in profit or loss, except to the extent that it relates to items recognized in other comprehensive income or directly in equity. In this case, the tax is also recognized in other comprehensive income or directly in equity, respectively.

Judgment and estimates

Significant judgment is required in determining the income tax expenses and corresponding provision for tax. There are many transactions and calculations for which the ultimate tax determination is uncertain as these matters are being contested at various legal forums. The Company recognizes liabilities for anticipated tax issues based on estimates of whether additional taxes will be due. Where the final tax outcome of these matters is different from the amounts that were initially recorded, such differences will impact the current and deferred tax assets and liabilities in the period in which such determination is made.

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Further, the carrying amount of deferred tax assets is reviewed at each reporting date and is adjusted to reflect the current assessment of future taxable profits. If required, carrying amount of deferred tax asset is reduced to the extent that it is no longer probable that sufficient taxable profits to allow the benefit of part or all of that recognized deferred tax asset to be utilized. Any such reduction shall be reversed to the extent that it becomes probable that sufficient taxable profit will be available.

Off-setting

Deferred tax assets and liabilities are offset when there is a legally enforceable right to offset current tax assets and liabilities and when the deferred tax balances relate to the same taxation authority. Current tax assets and tax liabilities are offset where the entity has a legally enforceable right to offset and intends either to settle on a net basis, or to realize the asset and settle the liability simultaneously.

b) Sales tax

Expenses and assets are recognized net of the amount of sales tax, except:

- When the sales tax incurred on a purchase of assets or services is not recoverable from the taxation authority, in which case, the sales tax is recognized as part of the cost of acquisition of the asset or as part of the expense item, as applicable; and
- When receivables and payables are stated with the amount of sales tax included.

The net amount of sales tax recoverable from, or payable to, the taxation authority is included as part of receivables or payables in the statement of financial position.

4.16 Trade and other payables

Liabilities for creditors and other amounts payable are carried at cost which is the fair value of the consideration to be paid in the future for the goods and / or services received, whether or not billed to the Company.

4.17 Provisions

Provisions are recognized in the statement of financial position when the Company has legal or constructive obligation as a result of past events, and it is probable that outflow of economic benefits will be required to settle the obligation and a reliable estimate of the amount can be made.

Judgement and estimates

As the actual outflows can differ from estimates made for provisions, the carrying amounts of provisions are reviewed at each reporting date and adjusted to take account of such changes. Any adjustments to the amount of previously recognized provision is recognized in the statement of profit or loss unless the provision was originally recognized as part of cost of an asset.

4.18 Borrowing costs

Borrowing costs directly attributable to the acquisition, construction or production of an asset that necessarily takes a substantial period of time to get ready for its intended use or sale are capitalized as part of the cost of the asset. All other borrowing costs are expensed in the period in which they occur. Borrowing costs consist of interest and other costs that an entity incurs in connection with the borrowing of funds.

4.19 Foreign currency transactions and translation

Transactions in foreign currencies are initially recorded by the Company in Rupees using the exchange rates prevailing at the date the transaction first qualifies for recognition.

Monetary assets and liabilities denominated in foreign currencies are translated into Rupees using spot rates of exchange at the reporting date. Differences arising on settlement or translation of monetary items are capitalized as described in Note 2 to the financial statements.

Non-monetary items that are measured in terms of historical cost in a foreign currency are translated using the exchange rates at the dates of the initial transactions.

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In determining the spot exchange rate to use on initial recognition of the related asset, expense or income (or part of it) on the derecognition of a non-monetary asset or non-monetary liability relating to advance consideration, the date of the transaction is the date on which the Company initially recognizes the non-monetary asset or non-monetary liability arising from the advance consideration. If there are multiple payments or receipts in advance, the Company determines the transaction date for each payment or receipt of advance consideration.

4.19 Standards, interpretations and amendments to published approved accounting standards that are not yet effective

The following amendments and interpretations with respect to the approved accounting standards as applicable in Pakistan, would be effective from the date mentioned below against the respective standard or interpretation and have not been adopted early by the Company:

Standard or Interpretation	Effective date (annual periods beginning on or after)
IFRS 17 - Insurance Contracts and related amendments	01 January 2023
IFRS 3 - Definition of a Business (Amendments)	01 January 2020
IAS 1 & IAS 8 - Definition of Material	01 January 2020
IAS 1 & IAS 8 - Presentation of Financial Statements Classification of liabilities	01 January 2023
IAS 16 - Property, Plant and Equipment — Proceeds before Intended Use (amendments)	01 January 2022
IAS 37 - Onerous Contracts — Cost of Fulfilling a Contract	01 January 2022
Covid-19-Related Rent Concessions (Amendment to IFRS 16)	01 June 2020
IFRS 10 - Consolidated Financial Statements and IAS 28 Investment in Associates and Joint Ventures - Sale or Contribution of Assets between an Investor and its Associate or Joint Venture (Amendment)	Not yet finalized
Annual Improvements to IFRS Standards 2018–2020	01 January 2022
IFRS - 4 Extension of the Temporary Exemption from Applying IFRS 9	01 January 2023
IFRS 7 & 9 - Financial instruments - Amendments regarding pre-replacement issues in the context of the interest rate benchmark reform (IBOR)	01 January 2020
Amendments to IFRS 3 - Business Combinations - Update a reference in IFRS 3 to the Conceptual Framework for Financial Reporting without changing the accounting requirements for business combinations.	01 January 2022

The above amendments are not expected to have any material impact on the Company's financial statements in the period of initial application.

The International Accounting Standards Board (IASB) has also issued the revised Conceptual Framework for Financial Reporting (the Conceptual Framework) in March 2018 which is effective for annual periods beginning on or after 1 January 2020 for preparers of financial statements who develop accounting policies based on the Conceptual Framework. The revised Conceptual Framework is not a standard, and none of the concepts override those in any standard or any requirements in a standard. The purpose of the Conceptual Framework is to assist IASB in developing standards, to help preparers develop consistent accounting policies if there is no applicable standard in place and to assist all parties to understand and interpret the standards.

Further, the following new standards have been issued by IASB which are yet to be notified by the Securities and Exchange Commission of Pakistan (SECP) for the purpose of applicability in Pakistan:

Standard	IASB effective date (Annual periods beginning on or after)
IFRS 1 - First-time Adoption of International Financial Reporting Standards	01 July 2009
IFRS 17 – Insurance Contracts	01 January 2021

The Company expects that adoption of above standards will not have any material impact on the Company's financial statements in the period of initial application.

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5. PROPERTY, PLANT AND EQUIPMENT

Operating fixed assets - owned
Capital work-in-progress

Note	2020 Rupees in thousands	2019 Rupees in thousands
5.1	101,891,264	105,871,790
5.2	10,310	-
	<u>101,901,574</u>	<u>105,871,790</u>

5.1 Operating fixed assets - owned

	2020							WRITTEN DOWN VALUE	Depreciation rate	
	COST			ACCUMULATED DEPRECIATION						
	As at 01 July 2019	Additions	Transfers	As at 30 June 2020	As at 01 July 2019	Charge for the year	Transfers	As at 30 June 2020		As at 30 June 2020
	Rupees in thousands			Rupees in thousands					%	
Land - freehold	14,513	-	-	14,513	-	-	-	14,513	-	
Civil work / building on freehold land	7,701,030	455,117	-	8,156,147	1,843,358	141,190	-	1,984,548	6,171,599	2
Power generation plant and equipment	120,946,329	1,269,115	228,837	122,444,281	28,260,910	4,924,405	130,992	33,316,307	89,127,974	4 - 45
General plant assets - ancillary equipment	2,963,222	3,736	-	2,966,958	721,736	174,264	-	896,000	2,070,958	4 - 25
Gas pipelines	1,595,440	-	-	1,595,440	243,668	48,567	-	292,235	1,303,205	3.3 - 10
Capital stores and spares	6,100,200	-	(228,037)	5,871,363	2,414,541	411,004	(130,992)	2,694,553	3,176,810	2 - 37
Furniture and fixtures	43,834	-	-	43,834	42,928	167	-	43,095	739	10
Vehicles	109,837	5,428	-	115,265	75,474	14,325	-	89,799	25,466	20
	<u>139,474,405</u>	<u>1,733,396</u>	<u>-</u>	<u>141,207,801</u>	<u>33,602,615</u>	<u>5,713,922</u>	<u>-</u>	<u>39,316,537</u>	<u>101,891,264</u>	

	2019							WRITTEN DOWN VALUE	Depreciation rate	
	COST			ACCUMULATED DEPRECIATION						
	As at 01 July 2018	Additions / transfers from Capital work- in-progress*	Adjustment (Note 5.1.3)	As at 30 June 2019	As at 01 July 2018	Charge for the year	Adjustment (Note 5.1.3)	As at 30 June 2019		As at 30 June 2019
	Rupees in thousands			Rupees in thousands					%	
Land - freehold	14,513	-	-	14,513	-	-	-	14,513	-	
Civil work / building on freehold land	7,668,329	32,701	-	7,701,030	1,705,304	138,054	-	1,843,358	5,857,672	2
Power generation plant and equipment	105,576,900	14,294,141	(505,672)	120,946,329	24,254,207	4,127,021	(120,318)	28,260,910	92,685,419	4 - 45
General plant assets - ancillary equipment	2,307,392	16,254	-	2,963,222	547,924	173,812	-	721,736	2,241,486	4 - 25
		639,576								
Gas pipelines	1,595,440	-	-	1,595,440	185,872	57,796	-	243,668	1,351,772	3.3 - 10
Capital stores and spares	6,049,060	51,140	-	6,100,200	1,919,601	494,940	-	2,414,541	3,685,659	2 - 37
Furniture and fixtures	43,834	-	-	43,834	42,761	167	-	42,928	906	10
Vehicles	109,769	68	-	109,837	59,441	16,033	-	75,474	34,363	20
	<u>123,365,237</u>	<u>16,614,840</u>	<u>(505,672)</u>	<u>139,474,405</u>	<u>28,715,110</u>	<u>5,007,823</u>	<u>(120,318)</u>	<u>33,602,615</u>	<u>105,871,790</u>	

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- 5.1.1 As explained in Note 1.2, the property and rights on certain assets were transferred to the Company on 02 March 1999 by WAPDA, in accordance with the terms and conditions of the BTA, between WAPDA and the Company. However, titles of the freehold land and vehicles, in the land revenue records and with the registration authority, respectively, have not been transferred in the name of the Company.
- 5.1.2 The cost of the assets as on 30 June 2020 includes fully depreciated assets amounting to Rs. 4,718,655 thousand (2019: Rs. 4,718,655 thousand) which are still in use of the Company.
- 5.1.3 This adjustment to power generation plant and equipment represents reversal of excess accrual capitalized in the year ended 30 June 2015 on estimate basis. Related depreciation charged in prior years, on the excess amount has also been reversed.
- 5.1.4 The additions to power generation plant and equipment include exchange loss in accordance with the exemption granted by SECP as stated in Note 2 to the financial statements. The movement in exchange loss capitalized is as follows:

	2020	2019
	---Rupees in thousands---	
Cost:		
Opening balance	20,546,792	6,395,657
Addition during the year	666,821	14,151,135
Closing balance	<u>21,213,613</u>	<u>20,546,792</u>
Less:		
Accumulated depreciation:		
Opening balance	322,158	63,711
Charge during the year	860,623	258,447
Closing balance	<u>1,182,781</u>	<u>322,158</u>
Written down value as at 30 June	<u>20,030,832</u>	<u>20,224,634</u>

- 5.1.5 On 14 December 2018, the GOP through Power Holding (Private) Limited (a company fully owned by the GOP and established to pay the power sector circular debt), has arranged Shariah Compliant Islamic Finance Facility through issuance of Sukuk-1 to Meezan Bank Limited amounting to Rs. 200,000 million, for the period of 10 years to settle the energy sector circular debts of all distribution companies (DISCOs). The facility is secured against the land owned by power sector entities comprising DISCOs/GENCOs. Accordingly, the GOP at the time of agreement hired independent valuer who has estimated the value of land. According to the said arrangement, the land of the Company worth Rs 1,428 million is also included in the security. The legal documents executed by the Company and the relevant counter parties reveal that the said assets have been leased out under Ijarah agreement to GOP with an undertaking to resell the assets to the Company at the end of Ijarah term. The proceeds of Sukuk Bonds have been retained by the PHPL and the said Sukuk and Ijarah rentals are to be repaid by the GOP. Further, according to the directives issued by the GOP vide letter No. PF-05(06)/12 dated 14 December 2018, the said transaction neither involves any physical transfer of the underlying assets nor creates any financial implication on the Company. Accordingly, the management has exercised its judgement and concluded that the conditions of transfer of control is not satisfied as per IFRS 15 and consequently, the said transaction is in substance, a financing arrangement. Accordingly, the Company is not required to derecognize the assets.

		2020	2019
		---Rupees in thousands---	
5.1.6 Depreciation charge for the year has been allocated as under:	Note		
Cost of revenue	24	5,599,644	4,789,755
Administrative expenses	25	114,278	97,750
		<u>5,713,922</u>	<u>4,887,505</u>

5.2 Capital work-in-progress

Opening balance	-	1,728,804
Additions during the year	10,310	491,732
Less : Transferred to property, plant and equipment	-	(2,220,536)
	<u>10,310</u>	<u>-</u>

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	Note	2020 ---Rupees in thousands---	2019
6. LONG TERM ADVANCES - unsecured			
Advances to employees against:			
House building / purchase of plot		60,641	59,044
Vehicles		2,644	3,005
	6.1	<u>63,285</u>	<u>62,049</u>
Less: Current portion of long-term advances	10	<u>(11,630)</u>	<u>(12,890)</u>
		<u>51,655</u>	<u>49,159</u>

6.1 Advances for house building and purchase of land are recoverable over 10 years, whereas, advances for car / motorcycle are recoverable over 5 years. Interest is charged on these advances at the same interest rate as that payable on the employees' balances with the General Provident Fund, maintained by WAPDA.

	Note	2020 ---Rupees in thousands---	2019
7. STORES, SPARE PARTS AND LOOSE TOOLS			
TPS Guddu		3,728,987	2,426,635
Less: Provision for slow moving / obsolete items		(95,402)	(95,402)
		<u>3,633,585</u>	<u>2,331,233</u>
TPS Quetta		159,062	159,062
Less: Provision for slow moving / obsolete items		(159,062)	(159,062)
		-	-
TPS Sukkur		24,607	24,607
Less: Provision for slow moving / obsolete items		(24,607)	(24,607)
		-	-
	7.1	<u>3,633,585</u>	<u>2,331,233</u>

7.1 Movement during the year is as follows:

Opening balance		2,610,304	2,363,817
Additions during the year	7.2	<u>2,040,254</u>	<u>686,425</u>
		4,650,558	3,050,242
Less:			
Issuance during the year		(721,366)	(439,938)
Written off during the year		(16,536)	-
		<u>(737,902)</u>	<u>(439,938)</u>
		3,912,656	2,610,304
Less: Provision for slow moving / obsolete items		<u>(279,071)</u>	<u>(279,071)</u>
		<u>3,633,585</u>	<u>2,331,233</u>

7.2 This mainly represent purchase of store, spare parts and loose tools for use in Central store, Block I, Block II and Block V, situated at TPS Guddu.

	Note	2020 ---Rupees in thousands---	2019
8. STOCK-IN-TRADE	8.1	<u>928,352</u>	<u>928,352</u>

8.1 This represents furnace oil and high speed diesel, initially procured to be used in the generation of electricity, testing of power plants and now held for emergency operations.

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8.2	Movement in stock-in-trade during the year is as follows:	Note	2020	2019
			---Rupees in thousands---	
	Opening balance		928,352	870,461
	Net Realizable Value (NRV) adjustment		-	58,164
	Consumed during the year		-	(273)
	Balance at the end of the year		<u>928,352</u>	<u>928,352</u>

9. TRADE DEBT - unsecured

	Receivable from CPPA-G	9.1	68,979,818	54,891,087
	Less: Provision for doubtful debt	9.3	(706,626)	(706,626)
			<u>68,273,192</u>	<u>54,184,461</u>

9.1 Movement in receivable from CPPA-G during the year is as follows:

	Opening recognized		54,891,087	17,951,359
	Revenue during the year from TPS Guddu	23	76,204,531	88,607,453
			<u>131,095,618</u>	<u>106,558,812</u>
	Less:			
	Funds received during the year		(62,115,800)	(46,696,000)
	Adjustment due to adoption of IFRS 15 as at 01 January 2019		-	(4,960,682)
	Against management fee paid on behalf of the Company		-	(11,043)
			<u>(62,115,800)</u>	<u>(51,667,725)</u>
		9.2	<u>68,979,818</u>	<u>54,891,087</u>

9.2 This includes receivable against supply of electricity:

			2020	2019
			---Rupees in thousands---	
	On open cycle generation	9.2.1	12,651,277	10,267,062
	From TPS Quetta	9.2.2	1,683,492	1,683,492
	From rental power project Naudero-I	9.2.3	722,852	722,852
			<u>15,057,621</u>	<u>12,673,406</u>

9.2.1 This represents amount receivable from CPPA-G in respect of supply of electricity on open cycle generation of the Company. The Company had invoiced CPPA-G, against the electricity supplied from 747 MW plant using rates applied for open cycle generation, which has not been acknowledged by CPPA-G on the basis of NEPRA's determination dated 27 April 2018, which stated that no such rates were allowed to the Company. The Company also intends to file a review petition with NEPRA against the said determination. Further, the Company expects to recover this amount in full and hence, no provision has been recognized against this amount.

9.2.2 This represents claims of the Company against supply of electricity from TPS Quetta. The amount is disputed between CPPA-G due to non-availability of the tariff determination from NEPRA for the same. However, the management of the Company based on the opinion of legal advisor is confident about full recovery of the balance, hence, no provision has been recorded in these financial statements.

9.2.3 This represents invoices against supply of electricity from rental power project Naudero-I for the period from May 2010 to March 2012 amounting to Rs. 1,639,293 thousands in gross. The amount is not processed by CPPA-G on the grounds that honorable Supreme Court of Pakistan (SCP) had declared all the contracts with rental power projects void ab initio. However, the management of the Company is confident of full recovery of the balance as the related electricity was supplied upon the instructions of National Transmission and Dispatch Company Limited. However, being prudent, the management has only recorded receivable balance amounting to Rs. 722,852 thousands which comprises only fuel cost and fixed cost component of the invoices excluding sales tax.

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- 9.3 This represents the provision made against the long term receivable from CPPA-G.
- 9.4 Maximum amount outstanding at anytime during the year with reference to month end was Rs. 79,177,746 thousand (2019: Rs. 54,981,087 thousand).
- 9.5 The age analysis is provided in Note 31.2.

	Note	2020	2019
----Rupees in thousands----			
10. ADVANCES, LOAN AND PREPAYMENTS			
Advances - unsecured	10.1	604,028	3,195,931
Loan to related party	10.2	424,770	238,617
Prepayments		1,104	-
		<u>1,029,902</u>	<u>3,434,548</u>

10.1 Advances - unsecured

Advances to employees against:

- Travelling		180	835
- Other expenses		1,057	896
		1,237	1,731

Advances to suppliers / contractors	10.1.1	632,914	3,181,310
Current portion of long term advances	6	11,630	12,890
		645,781	3,195,931
Less: Provision for doubtful advances	10.1.2	(41,753)	(41,753)
		<u>604,028</u>	<u>3,154,178</u>

- 10.1.1 This includes an advance of Rs. 491,022 thousand (2019: Rs. 566,296 thousand) paid to the Chief Resident Representative Karachi (CRRK) WAPDA, an associated entity, for the import of equipments, stores and spare parts.

Maximum amount outstanding with CRRK WAPDA at anytime during the year with reference to month end amounted to Rs. 639,296 thousand (2019: Rs. 1,099,744 thousand).

- 10.1.2 These represent advances extended to following parties against rental power projects:

		2020	2019
		----Rupees in thousands----	
<u>Party Name</u>	<u>Project</u>		
Pakistan Power Resource-LLC	110 MW Guddu	1,404	1,404
Walters Power International	51 MW Naudero-I	40,349	40,349
		<u>41,753</u>	<u>41,753</u>

The Company has issued demand notices for recovery of these advances. The matter is under investigation by the National Accountability Bureau (NAB), as part of the larger investigation ordered by the honorable Supreme Court of Pakistan into rental power projects. The management of the Company is confident about the recovery of advances, however, as a matter of prudence, the Company has recognized a provision against the full amount.

- 10.2 This represents loan given to Lakhra Power Generation Company Limited (GENCO-IV), an associated company. The loan is interest free and has been given under the instructions of GOP.

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11. OTHER RECEIVABLES	Note	2020	2019
		---Rupees in thousands---	
Due from:			
Associated undertakings	11.1	994,006	1,016,158
Walters Power International	11.2	194,056	194,056
		1,188,062	1,210,214
Accrued interest on bank deposits		9,404	5,460
Less:		1,197,466	1,215,674
Provision for doubtful receivable from Walter Power International	11.2	(194,056)	(194,056)
		<u>1,003,410</u>	<u>1,021,618</u>

11.1 Due from associated undertakings

WAPDA	11.1.1	135,327	131,777
Northern Power Generation Company Limited (NPGCL)		767,701	774,816
Chief Resident Representative Karachi (CRRK)		6,532	23,669
Jamshoro Power Generation Company Limited (GENCO-I)		84,446	85,764
Lakhra Power Generation Company Limited (GENCO-IV)		-	132
	11.1.2	<u>994,006</u>	<u>1,016,158</u>

11.1.1 The net amount includes a receivable from WAPDA as follows:

Workers' Welfare Fund	32,773	29,223
Others	102,554	102,554
	<u>135,327</u>	<u>131,777</u>

11.1.2 Maximum amounts outstanding at anytime during the year calculated with reference to month end balance as follows:

	2020	2019
	---Rupees in thousands---	
WAPDA	39,638	133,229
Northern Power Generation Company Limited (GENCO-III)	771,239	760,998
Jamshoro Power Generation Company Limited (GENCO-I)	85,861	85,669
Lakhra Power Generation Company Limited (GENCO-IV)	-	151

The receivable is unsecured and is neither past due nor impaired.

11.2 This amount is receivable from Walters Power International against the cost of gas used during the trial run period, paid by the Company, in the year ended 30 June 2010 and 2011. The amount is doubtful due to ongoing investigation of NAB as disclosed above in Note 10.1.2. Therefore, being prudent, the Company has recognized a provision against the full amount.

12. TAX REFUNDS DUE FROM THE GOVERNMENT	Note	2020	2019
		---Rupees in thousands---	
Sales tax	12.1	4,274,507	3,581,177
Less : Provision for doubtful refunds		(492,807)	(492,807)
Sales tax - net		3,781,700	3,088,370
Income tax		480,823	914,454
		<u>4,262,523</u>	<u>4,002,824</u>

12.1 This includes an amount of Rs. 100,000 thousand deposited by the Company in 2017 under the protest, in the government treasury, in response to a verbal demand of the taxation authorities. The management is confident of full recovery.

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	Note	2020 ---Rupees in thousands---	2019
13. BANK BALANCES			
Deposit accounts - local currency	13.1	<u>10,166,613</u>	<u>6,105,556</u>
13.1	These carry interest ranging from 7.5% to 12.7% (2019: 4.5% to 11.65%) per annum.		
14. ISSUED, SUBSCRIBED AND PAID-UP SHARE CAPITAL			
50,000 (2019: 50,000) ordinary shares of Rs. 10 each, fully paid in cash	14.1	<u>500</u>	<u>500</u>
14.1	All the shares are held by the Government of Pakistan (GOP).		
15. DEPOSIT FOR SHARES			
Incorporation expenses incurred by WAPDA		5,020	5,020
Allocation of debt services liability	15.1	3,070,460	3,070,460
Conversion of long term loan	15.2	<u>268,439</u>	<u>268,439</u>
		<u>3,343,919</u>	<u>3,343,919</u>
15.1	This represents the debt services provided by WAPDA on foreign relent and cash development loans, against which the Company will issue shares to WAPDA, upon WAPDA's instructions.		
15.2	This represents the conversion of long-term loans obtained by WAPDA, and payable to the GOP, into equity of the GOP in WAPDA. WAPDA has passed this effect to the Company. The Company will issue shares to WAPDA, upon WAPDA's instructions.		
16. LONG TERM FINANCING			
From financial institutions, secured			
Foreign direct loans	16.1	39,135,390	46,627,483
From related party, unsecured			
Foreign relent loans	16.2	133,854	133,854
Cash development loans			
- For 747MW	16.3	7,873,396	7,873,396
- For general purpose	16.4	171,142	171,142
		<u>8,044,538</u>	<u>8,044,538</u>
		<u>47,313,782</u>	<u>54,805,875</u>
Less : Current portion shown under current liabilities			
Foreign direct loans		8,696,753	8,477,724
Foreign relent loans		133,854	133,854
Cash development loans:			
- For 747MW		713,848	546,153
- For general purpose		102,369	79,835
		<u>9,546,824</u>	<u>9,237,566</u>
		<u>37,666,958</u>	<u>45,568,309</u>
16.1	This represents an export credit facility obtained from a consortium of banks for a period of 6 years, with Hong Kong Shanghai Banking Corporation and The Export-Import Bank of China as the mandated lead arrangers, having a sanctioned limit of \$ 464,084,737. The last tranche was drawn during 2016. Actual drawdown amounted to \$ 463,826,843 equivalent to Rs. 48,701,818 thousand at spot exchange rate. The loan was obtained to finance the 747 MW power generation plant, and is repayable in eighteen equal semi-annual installments commencing from 21 January 2016. The loan carries mark-up at the rate of LIBOR plus 2.4% with the effective interest rate of 4.24% as of 30 June 2020 (2019: LIBOR plus 2.4% with the effective interest rate of 5.22%). The loan is secured by way of a guarantee issued by the President of the Islamic Republic of Pakistan, through the Ministry of Finance and Revenue (MoFR).		

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- 16.2** These represent various re-lent loans granted to the Company from MoFR through WAPDA, for the purpose of meeting cash requirements of the Company. These loans were payable in 12 to 13 equal annual installments, commencing from 30 June 2004. The interest rate on these loans is 11% (2019: 11%) per annum. The Company has not made any payment to settle the principal, and related interest accrued, since the year ended 30 June 2015. However, the Company intends to settle the outstanding balance in due time, after receipt of specific instructions from MoFR.
- 16.3** These represent three loans obtained by the Company from MoFR for financing 747 MW power generation plant. The loans are repayable in 20 annual installments, commencing from 30 June 2011. The interest rate on these loans ranges from 12.64% to 13.61% (2019: 12.64% to 13.61%) per annum. The interest payment commenced from 30 June 2016. The Company has not made any payment to settle the principal, and related interest accrued, since the year ended 30 June 2015. However, the Company intends to settle the outstanding balance in due time, after receipt of specific instructions from MoFR.
- 16.4** These represent two loans obtained by the Company from MoFR through WAPDA for the purpose of meeting general cash requirements of the Company. These loans are repayable in 20 equal annual installments, commencing from 30 June 2004. The interest rate on these loans ranges from 17.71% to 18.03% (2019: 17.71% to 18.03%) per annum. The Company has not made any payment to settle the installments, and related interest accrued, since the year ended 30 June 2015. However, the Company intends to settle the outstanding balance in due time, after receipt of specific instructions from MoFR.
- 16.5** As at 30 June 2020, total loan installments and interest accrued amounting to Rs. 759,843 (2019: Rs. 592,495) thousand and Rs. 5,195,460 (2019: Rs. 4,191,662) thousand, respectively, are overdue. The remaining outstanding balances and the related interest accrued will also be settled upon specific instructions from MoFR. All of the overdue balances have been shown under current liabilities and no interest is charged on the outstanding balance, after their due dates.

	2020	2019
	---Rupees in thousands---	
16.6 The movement in long term financing is as follows:		
Opening balance	54,805,875	48,912,696
Repayments during the year	(8,154,592)	(6,908,184)
Exchange loss for the year - net	662,499	12,801,363
	<u>47,313,782</u>	<u>54,805,875</u>

17. DEFERRED TAXATION - NET

Deferred tax liability resulting from:		
Accelerated depreciation on property, plant and equipment	16,813,410	16,184,541
Deferred tax asset resulting from:		
Unabsorbed depreciation	(5,218,661)	(6,359,203)
Staff retirement benefits	(8,961,315)	(7,954,156)
Provision for doubtful debts	(204,922)	(204,922)
Tax credit under section 65B	-	(553,196)
Provision for disputed gas payables	(118,748)	(118,748)
	<u>(14,503,646)</u>	<u>(15,190,225)</u>
	<u>2,309,764</u>	<u>994,316</u>

18. DEFERRED GRANT

Opening balance		397,181	595,771
Less: Amortized during the year	26	(198,590)	(198,590)
		<u>198,591</u>	<u>397,181</u>

- 18.1** This represents the grant received from United States Agency for International Development (USAID) for major overhauling of the 800 MW plant of the Company.

19. STAFF RETIREMENT BENEFITS

Four types of staff benefits are offered by the Company itself, namely pension obligations, medical benefits, free electricity and accumulated compensated absences.

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	Defined benefit scheme						Other long-term benefit		Total	
	Pension obligations - unfunded		Medical benefits		Free electricity		Accumulated compensated absences			
	2020	2019	2020	2019	2020	2019	2020	2019	2020	2019
Rupees in thousands										
19.1 The amounts recognized in the statement of financial position										
Present value of defined benefit obligations	24,604,429	21,720,692	3,467,102	2,625,777	2,086,692	2,255,177	742,862	826,478	30,901,085	27,428,124
19.2 Changes in the present value of defined benefit obligations:										
Opening balance	21,720,692	19,370,212	2,625,777	2,475,945	2,255,177	1,079,291	826,478	795,919	27,428,124	23,721,367
Current service cost	188,027	191,530	57,456	50,856	85,642	87,145	493	3,652	331,618	333,183
Interest cost	3,080,161	1,899,547	373,720	244,364	326,949	107,893	111,867	76,073	3,892,697	2,327,877
Benefits paid during the year	(956,407)	(749,476)	(96,796)	(64,619)	(716)	(725)	(82,898)	(70,388)	(1,136,817)	(885,208)
Actuarial loss / (gain) on obligation	571,956	1,008,879	506,945	(80,769)	(580,360)	981,573	(113,078)	21,222	385,463	1,930,905
Balance at the end of the year	24,604,429	21,720,692	3,467,102	2,625,777	2,086,692	2,255,177	742,862	826,478	30,901,085	27,428,124
19.3 Charge for the year to:										
Profit or loss										
Current service cost	188,027	191,530	57,456	50,856	85,642	87,145	493	3,652	331,618	333,183
Interest cost	3,080,161	1,899,547	373,720	244,364	326,949	107,893	111,867	76,073	3,892,697	2,327,877
Actuarial (gain) / loss recognized	-	-	-	-	-	-	(113,078)	21,222	(113,078)	21,222
	3,268,188	2,091,077	431,176	295,220	412,591	195,038	(718)	100,947	4,111,237	2,682,282
Other comprehensive income										
Actuarial loss / (gain)	571,956	1,008,879	506,945	(80,769)	(580,360)	981,573	-	-	498,541	1,909,683
19.3.1 Charge to profit or loss has been allocated as follows:										
Cost of revenue	3,039,415	1,944,702	400,994	274,555	383,710	181,385	(668)	93,881	3,823,451	2,494,523
Administrative expenses	228,773	146,375	30,182	20,665	28,881	13,653	(50)	7,066	287,786	187,759
	3,268,188	2,091,077	431,176	295,220	412,591	195,038	(718)	100,947	4,111,237	2,682,282

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19.4 Significant actuarial assumptions at the reporting date are:	Defined benefit scheme						Other long-term benefit	
	Pension obligations - unfunded		Medical benefits		Free electricity		Accumulated compensated absences	
	2020	2019	2020	2019	2020	2019	2020	2019
Discount rate	10.00%	14.50%	10.00%	14.50%	10.00%	14.50%	10.00%	14.25%
Future salary increase	10.00%	14.50%	10.00%	14.50%	-	-	10.00%	14.25%
Long-term salary increase rate	10.00%	14.50%	10.00%	14.50%	-	-	10.00%	14.25%
Indexation rate	8.00%	8.25%	-	-	-	-	-	-
Medical indexation rate - medical allowance	-	-	2.50%	2.50%	-	-	-	-
Medical indexation rate - medical facility	-	-	10.00%	10.00%	-	-	-	-
Annual medical claim - medical facility	-	-	Rs.63,864p.a.	Rs.50,307p.a.	-	-	-	-
Electricity indexation rate (p.a.)	-	-	-	-	8.00%	12.50%	-	-

19.5 Historical information:	Experience adjustments on obligations				Present value of defined benefit obligations			
	Pension obligations	Medical benefits	Free electricity	Compensated absences	Pension obligations	Medical benefits	Free electricity	Compensated absences
	Rupees in thousands				Rupees in thousands			
2020	571,956	506,945	(580,360)	(113,078)	24,604,429	3,467,102	2,086,692	742,862
2019	1,008,879	(80,769)	981,573	21,222	21,720,692	2,625,777	2,255,177	826,478
2018	731,079	(105,293)	(1,397,001)	26,293	19,370,212	2,475,945	1,079,291	795,919
2017	440,887	406,356	(1,293,223)	64,214	16,556,695	2,268,604	2,183,122	717,986
2016	1,601,587	(470,753)	957,121	-	14,931,811	1,677,886	3,175,018	643,778
2015	2,377,583	456,501	(66,241)	-	12,500,241	1,897,371	1,950,483	972,990

19.6 Risks associated with the above benefits:

The defined benefit plans expose the Company to the following risks:

Final salary risk - The risk that the final salary at the time of cessation of service is greater than what was assumed.

Longevity risks - The risk arises when the actual lifetime of retirees is longer than expectation. This risk is measured at the plan level over the entire retiree population.

Withdrawal risk - The risk of higher or lower withdrawal experience than assumed. The final effect could go either way depending on the beneficiaries' service/age distribution and the benefit.

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19.7 Sensitivity analysis

The calculations of the defined benefit obligation and other long-term benefit are sensitive to the significant actuarial assumptions, as disclosed in Note 19.4. The table below summarizes how the defined benefit obligation and long-term benefit at the end of the reporting period would have increased / decreased, as a result of change in respective significant assumptions:

	Impact on defined benefit	
	1% increase in assumption	1% decrease in assumption
	---Rupees in thousands---	
Discount rate		
Pension obligation - unfunded	21,676,134	28,802,986
Medical benefits	2,879,489	4,189,861
Free electricity	1,761,890	2,479,553
Accumulated compensated absences	684,001	800,750
Salary increase rate		
Pension obligation - unfunded	25,096,595	23,933,766
Medical benefits	807,156	677,553
Pension indexation rate		
Pension obligation - unfunded	28,307,077	21,974,660
Medical inflation rate		
Medical benefits	4,228,809	2,884,060
Electricity indexation rate		
Free electricity	2,515,349	1,732,093

19.8 As at reporting date, the weighted average life of the defined benefit and long term benefit scheme was 14 years (2019: 11.75 years).

19.9 Expected defined benefit cost to be recognized for the year ended 30 June 2021, would be as follows:

	Rupees in thousands
Pension obligations - unfunded	2,667,273
Medical benefits	409,912
Free electricity	302,876
Accumulated compensated absences	74,829
	<u>3,454,890</u>

20. TRADE AND OTHER PAYABLES

	Note	2020	2019
		---Rupees in thousands---	
Trade creditors	20.1	91,184,218	75,240,724
Payable for capital expenditure		420,127	398,277
Payable to General Electrics		4,816,681	7,381,938
Due to associated undertakings	20.2	7,161,404	6,252,106
Amounts withheld from gas suppliers		409,477	409,477
Accrued liabilities		409,199	196,332
Retention money payable		4,278	7,883
Withholding tax payable		11,073	3,379
Other liabilities		44,183	65,367
		<u>104,460,640</u>	<u>89,955,483</u>

20.1 This includes Gas Infrastructure Development Cess (GIDC) payable to gas suppliers is amounting to Rs. 10,473,482 thousand. The GIDC payable by the Company forms part of the tariff approved by NEPRA. The movement is as follows:

	2020	2019
	---Rupees in thousands---	
Opening balance	11,096,016	7,411,870
Accrued during the year	6,130,456	9,945,343
Payment during the year	(6,752,990)	(6,261,197)
	<u>10,473,482</u>	<u>11,096,016</u>

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20.2 Due to associated undertakings

This represents the net amounts payable to various related parties on account of free electricity provided to the families of the Company's employees, residing within the territorial jurisdiction of these related parties, and payments of other expenses incurred on behalf of the Company. A party wise breakup is as follows:

	2020	2019
	---Rupees in thousands---	
Faisalabad Electric Supply Company Limited	7,745	5,522
Gujranwala Electric Power Company Limited	3,533	2,669
Hyderabad Electric Supply Company Limited	1,503,880	1,499,556
Quetta Electric Supply Company Limited	4,344	3,297
Islamabad Electric Supply Company Limited	6,018	5,371
Lahore Electric Supply Company Limited	7,526	4,619
Multan Electric Power Company Limited	68,468	53,652
Peshawar Electric Supply Company Limited	3,431	3,144
Sukkur Electric Power Company Limited	5,184,040	4,323,300
WAPDA	48,015	48,795
National Transmission Dispatch Company Limited	299,180	302,181
Lakhra Power Generation Company Limited (GENCO-IV)	5,167	-
GENCO Holding Company Limited	20,057	-
	<u>7,161,404</u>	<u>6,252,106</u>

21. INTEREST ACCRUED ON LONG TERM FINANCING

Foreign direct loan	747,563	1,088,364
Guarantee fee on foreign direct loan	1,542,491	1,342,678
Foreign relent loan	15,668	15,668
Cash development loans:		
For 747MW	5,045,736	4,061,725
For general purpose	134,067	114,270
	<u>5,179,793</u>	<u>4,175,995</u>
	<u>7,485,515</u>	<u>6,622,705</u>

22. CONTINGENCIES AND COMMITMENTS

22.1 Contingencies:

22.1.1 A large number of small cases have been filed against the Company, primarily by the Company's employees and vendors, the quantum of which cannot be estimated reliably. However, the management is of the view that in the overall context of these financial statements, there would be no significant liability on the part of the Company, in respect of such cases.

22.1.2 The Company has not accounted for interest on overdue payments of its gas suppliers i.e. Pakistan Petroleum Limited (PPL) and Mari Petroleum Company Limited (MPCL), amounting to Rs. 17,145,233 (2019: Rs. 12,881,291) thousand and Rs. 4,944,575 (2019: Rs. 2,579,962) thousand respectively, as calculated by the Company against Rs. 22,011,848 (2019: Rs. 15,067,642) thousand demanded by PPL and Rs. 13,715,439 (2019: Rs. 10,029,000) thousand demanded by MPCL. The Company has signed Gas Supply Agreement and Gas Sales Term Sheet with PPL, on 23 October 2017, and MPCL, on 20 June 2017, effective from 08 May 2013 and 09 February 2016 respectively. These arrangements replaced the previous Gas Supply Agreements (Old GSAs) signed between WAPDA and these counterparties, with effect from respective effective date. The respective Gas Supply Agreements and Gas Sales Term Sheet with PPL and MPCL require the Company to pay Late Payment Surcharge (LPS), at the rate of six months KIBOR + 2.5% and at an average rate of six months KIBOR + 2.5%, respectively. LPS was also payable under the Old GSAs. The Company, however, has not yet made a final estimate of the amount which the Company shall be liable to pay in respect of LPS; and is currently in negotiation with MPCL and PPL to waive off any LPS. As management is confident that the LPS shall be waived off by the respective parties, the related charges have not been recognized by the Company in these financial statements.

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Further, the Company has claimed LPS from Central Power Purchasing Agency – (Guaranteed) Limited (CPPA – G) due to delayed payments by CPPA-G amounting to Rs. 18,062,870 (2019: Rs. 10,888,455) thousand. However, the Company has not recognized the amount receivable in these financial statements.

Moreover, finalization of agreement with SNGPL is in process, whereas, the Company has ceased to purchase gas from SSGCL. SNGPL have demanded Rs. 13,661,664 (2019: Rs. 10,954,858) thousand as interest on overdue payments. The management of the Company contends that the Company is only liable to pay the interest only after formal terms and conditions have been agreed with these gas suppliers.

- 22.1.3 The Company has withheld payment of its contribution towards the Workers' Profit Participation Fund (WPPF). The matter is pending for decision with the Economic Coordination Committee upon a recommendation submitted by WAPDA to exempt the corporatized entities under its umbrella, from the requirements of the Companies Profit (Workers' Participation) Act, 1968, and accordingly, the Company has not made a provision against WPPF, amounting to Rs. 158 million (2019: 250 million), in respect of the current year.
- 22.1.4 The Assistant Commissioner Inland Revenue (ACIR) passed an order under section 122(1)/(5) of the Ordinance for the tax year 2011 while disallowing certain expenses claimed by the Company and imposition of minimum tax, resulting in an impugned demand of Rs. 35,938 thousand. Being aggrieved, the Company filed an appeal before CIR (Appeals) against impugned order passed by the learned ACIR, which was decided against the Company. Being aggrieved by the order, the Company has filed second appeal before the ATIR, which is pending adjudication. the Company's counsel is of the view that the matter will be decided in favor of the Company, accordingly, no provision has been made in these financial statements.
- 22.1.5 The Company was selected for audit under section 214(c) of the Ordinance for the tax year 2014. On the basis of audit, the assessing officer amended the original assessment under section 122(1) on the observation that the Company has not charged minimum tax under section 113 of the Ordinance, disallowing certain expenses under different heads of account and thereby created the demand amounting to Rs. 317,213 thousand. Being aggrieved, the Company filed an appeal before the CIR (Appeals), who had granted relief to the extent of minimum tax and on certain expense under section 21(c) of the Ordinance. Accordingly, the Company has filed second appeal before the ATIR, which is pending adjudication. The Company's counsel is of the view that the matter will be decided in favor of the Company, accordingly, no provision has been made in these financial statements.
- 22.1.6 The learned DCIR passed an order under section 11(2) of the Sales Tax Act (the "ST Act") while disallowing input tax claimed by the Company on household appliances ceramic products and laboratory apparatus and thereby created impugned demand amounting to Rs. 417 thousand along with the default surcharge of Rs. 215 thousand and penalty of Rs. 13 thousand for the tax periods from July 2015 to April 2017. Being aggrieved, the Company filed an appeal before the CIR (Appeals), which is pending adjudication. the Company's counsel is of the view that the matter will be decided in favor of the Company, accordingly, no provision has been made in these financial statements.
- 22.2 Commitments:**
- 22.2.1 Commitments in respect of contracts for capital expenditure amount to Rs. 243,131 (2019: Rs. 773,087) thousand.
- 22.2.2 Commitments in respect of contracts, other than capital expenditure, amount to Rs. 112,169 (2019: Rs. 130,618) thousand.
- 22.2.3 The Company has furnished indemnity bonds to the Collector of Customs to avail the exemption under SRO 567 (I) / 2006 dated 05 June 2006 amounting to Rs. 1,905,726 (2019: Rs. 1,905,726) thousand in respect of custom duty payable on account of equipment imported for the Naudero-I Rental Power Project.

23. REVENUE FROM CONTRACT WITH CUSTOMER - NET	Note	2020	2019
		----Rupees in thousands----	
Energy charges		53,678,698	67,941,497
Less: Sales tax	23.1	(7,799,469)	(9,871,841)
Net energy charges		45,879,229	58,069,656
Capacity charges		22,525,833	20,665,956
		<u>68,405,062</u>	<u>78,735,612</u>

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		2020	2019
Timing of revenue recognition - net		---Rupees in thousands---	
At a point in time		45,879,229	58,069,656
Over the time		<u>22,525,833</u>	<u>20,665,956</u>
		<u><u>68,405,062</u></u>	<u><u>78,735,612</u></u>
23.1	This represent sales tax chargeable under federal sales tax laws applicable on revenue as defined under the relevant laws.		
23.2 Contract balances		---Rupees in thousands---	
Trade debt		<u>68,273,192</u>	<u>54,184,461</u>
	The Company trade debts increased due to less receipts from CPPA-G during the year.		
23.3 Performance obligation			
	Performance obligations are satisfied when capacity is made available and NEO is delivered to CPPA-G over the time and at a point in time respectively.		
23.4 Units sold		-----KWh-----	
Energy (KWh)		<u>5,921,761,001</u>	<u>9,384,298,202</u>
Capacity (KW) - original		<u>1,640,790</u>	<u>2,120,790</u>
23.4.1	The capacity disclosed above reflects installed capacity of all plants, currently in operation. However, the Company intends to appoint an independent assessor for reassessment of dependable capacity of its plants.		
23.5 Average rates of energy		2020	2019
Energy charges (Rs. per KWh)		<u>7.75</u>	<u>6.19</u>
Capacity charges (Rs. per KWh per month)		<u>2,533.54</u>	<u>1,888.59</u>
24. COST OF REVENUE	Note	2020	2019
		---Rupees in thousands---	
Fuel consumed	24.1	48,414,203	58,081,306
Salaries, wages and other benefits	24.2	5,779,790	4,636,664
Depreciation	5.1.6	5,599,644	4,789,755
Repair and maintenance		1,494,920	594,179
Power, gas and water		377,438	333,260
Insurance		2,182	-
Traveling expenses		58,290	67,335
Vehicle running expenses		34,928	31,327
Stores consumed		19,031	27,887
		<u>61,780,426</u>	<u>68,561,713</u>
24.1	This represents cost of gas consumed in the generation of electricity and includes provision for GIDC, amounting to Rs. 5,239,706 thousand (2019: 8,500,293 thousand).		

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		2020	2019
		----Rupees in thousands----	
24.2	These include provisions for post employment and other long term benefits as follows:		
	Pension obligations - unfunded	19.3.1 3,039,415	1,944,702
	Medical benefits	19.3.1 400,994	274,555
	Free electricity	19.3.1 383,710	181,385
	Accumulated compensated absences	19.3.1 (668)	93,881
		<u>3,823,451</u>	<u>2,494,523</u>
25.	ADMINISTRATIVE EXPENSES		
	Salaries, wages and other benefits	25.1 435,038	348,996
	Management fee	68,908	120,738
	Depreciation	5.1.6 114,278	97,750
	Repairs and maintenance	203,853	81,024
	NEPRA fees	29,995	36,353
	Power, gas and water	38,409	37,687
	Security expenses	17,724	12,093
	Provision for doubtful debt	9 -	706,626
	Advertisement	9,677	10,713
	Vehicle expenses	11,643	10,442
	Legal and professional fees	14,420	7,468
	Traveling expenses	4,387	5,068
	Office supplies	4,171	4,406
	Directors' remuneration	4,654	4,524
	Communication charges	3,525	3,606
	Miscellaneous expenses	16,513	2,819
	Auditors' remuneration	25.2 2,250	1,950
	Advances written off	-	791
		<u>979,445</u>	<u>1,493,054</u>
25.1	These include provisions for post employment and other long term benefits as follows:		
	Pension obligations - unfunded	19.3.1 228,773	146,375
	Medical benefits	19.3.1 30,182	20,665
	Free electricity	19.3.1 28,881	13,653
	Accumulated compensated absences	19.3.1 (50)	7,066
		<u>287,786</u>	<u>187,759</u>
25.2	Auditors' Remuneration		
	Annual statutory audit	1,800	1,500
	Out of pocket expenses	450	450
		<u>2,250</u>	<u>1,950</u>
26.	OTHER INCOME		
	Income from financial assets:		
	Profit on bank deposits	273,556	140,123
	Income from other than financial assets:		
	Amortization of deferred grant	18 198,590	198,590
	NRV adjustment	-	58,164
	Rent	25,775	14,606
	Training charges	2,867	9,888
	Penalties recovered	2,731	9,175
	Electricity charges	14,775	8,082
	Sale of scrap material	1,241	2,651
	Tender fee	303	229
	Miscellaneous	10,725	45,681
		<u>257,007</u>	<u>347,066</u>
		<u>530,563</u>	<u>487,189</u>

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27. FINANCE COSTS	Note	2020 ----Rupees in thousands----	2019
Interest on:			
Foreign direct loans		1,818,025	2,281,619
Cash development loans		1,003,798	1,023,973
		2,821,823	3,305,592
Exchange loss on foreign direct loans - realized		-	818,974
Guarantee fee on foreign direct loans		199,812	46,941
Others		11,659	2,086
		3,033,294	4,173,593
28. TAXATION			
Current taxation:			
Provision for Minimum Tax / Alternate Corporate Tax	28.1	1,026,095	921,865
Tax credit	28.2	(553,196)	(921,865)
		472,899	-
Deferred taxation		1,460,025	1,477,599
		1,932,924	1,477,599

28.1 The provision for current tax includes Minimum Tax @ 1.5% of turnover for the current year and Alternate Corporate Tax @ 17% of the accounting profit, under the provisions of the Income Tax Ordinance, 2001, as amended by the relevant Finance Acts.

28.2 This represents tax credits awarded to the Company under section 65B of the Income Tax Ordinance, 2001.

28.3 Reconciliation between the tax chargeable on accounting profit and taxable profit is not relevant as the company is subject to minimum tax. Hence, is not presented.

29. TRANSACTIONS WITH RELATED PARTIES

29.1 Particulars of related parties and associated undertakings

The related parties comprise of the Government of Pakistan (GOP), GOP owned entities, WAPDA, associated companies, Directors of the Company and companies with common directorship and key management personnel. A list of all related parties along with percentage of shares is given below:

Associated Company, related party and Undertaking	Basis of relationship	Percentage of shareholding
Government of Pakistan	Shareholding	100%
GENCO Holding Company Limited	Managing entity	N/A
Central Power Purchasing Authority (CPPA-G)	Government related entity	N/A
Faisalabad Electric Supply Company Limited	Government related entity	N/A
Gujranwala Electric Power Company Limited	Government related entity	N/A
Hyderabad Electric Supply Company Limited	Government related entity	N/A
Quetta Electric Supply Company Limited	Government related entity	N/A
Islamabad Electric Supply Company Limited	Government related entity	N/A
Lahore Electric Supply Company Limited	Government related entity	N/A
Multan Electric Power Company Limited	Government related entity	N/A
Peshawar Electric Supply Company Limited	Government related entity	N/A
Sukkur Electric Power Company Limited	Government related entity	N/A
National Transmission and Dispatch Company Limited	Government related entity	N/A
Jamshoro Power Company Limited (GENCO-I)	Government related entity	N/A
Northern Power Generation Company Limited (GENCO-III)	Government related entity	N/A
Lakhra Power Generation Company Limited (GENCO-IV)	Government related entity	N/A
Sui Southern Gas Company Limited (SSGCL)	Government related entity	N/A
Sui Northern Gas Pipelines Limited (SNGPL)	Government related entity	N/A
Mari Petroleum Company Limited (MPCL)	Government related entity	N/A
Pakistan Petroleum Limited (PPL)	Government related entity	N/A
WAPDA	Government related entity	N/A
Chief Resident Representative Karachi - WAPDA	Government related entity	N/A

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29.2 Transactions with related parties:

Transactions with related parties are entered into at mutually agreed terms. The sale / purchase prices of electricity are controlled by the NEPRA. The Company in the normal course of business carries out transactions with various related parties. Amounts due from related parties are disclosed in the relevant notes to these financial statements. Transactions not disclosed elsewhere are as follows:

Associated Undertakings		2020	2019
		---Rupees in thousands---	
CPPA-G	Electricity sales	76,204,531	88,607,453
	Funds received during the year	62,115,800	46,696,000
WAPDA, associated companies	Electricity and other utility purchases	71,423	52,119
	Credit Movement	848,539	885,504
Government of Pakistan	Interest and guarantee fee on long-term financing	1,203,610	1,070,914
SNGPL	Purchase of gas	7,860,805	15,210,496
	Payments made during the year	8,877,345	6,689,942
PPL	Purchase of gas	35,771,051	31,871,483
	Payments made during the year	19,779,392	12,499,462
MPCL	Purchase of gas	13,013,630	21,121,880
	Payments made during the year	12,062,063	7,642,596
GENCO Holding Company Limited	Management Fee, other utility purchases	95,972	120,738

Other transactions with the GOP, and GOP owned entities are not disclosed, as management is of the opinion that it is impracticable to disclose such transactions due to the nature of the Company's operations.

The transactions with key management personnel under the terms of employment are disclosed in Note 30.

30. REMUNERATION OF THE CHIEF EXECUTIVE, DIRECTORS AND EXECUTIVES

The aggregate of amounts charged in the financial statements for the remuneration including benefits paid to the Chief Executive, Directors and Executives of the Company, are given below:

	2020		
	Chief Executive	Directors	Executives
	-----Rupees in thousands-----		
Managerial remuneration	8,507	4,654	102,788
Bonus	1,020	-	740
	<u>9,527</u>	<u>4,654</u>	<u>103,528</u>
Number of person(s)	<u>1</u>	<u>8</u>	<u>37</u>
	2019		
	Chief Executive	Directors	Executives
	-----Rupees in thousands-----		
Managerial remuneration	3,454	4,524	68,628
Bonus	164	-	3,538
	<u>3,618</u>	<u>4,524</u>	<u>72,166</u>
Number of person(s)	<u>1</u>	<u>8</u>	<u>29</u>

In addition, the Chief Executive is also provided with a Company maintained vehicle for official and private purposes, unfurnished residential accommodation and free electricity as per entitlement.

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30.1 The aggregate amount charged in these financial statements, for the year ended 30 June 2020, as fees to Directors is Rs. 4,445 thousand (2019: 4,524 thousand) for attending the meetings of the Board of Directors and its sub-committees.

31. FINANCIAL RISK MANAGEMENT

The Company's principal financial liabilities, other than derivatives, comprise long-term borrowings, Interest accrued on long term financing and trade and other payables. The main purpose of these financial liabilities is to finance the Company's operations. The Company's principal financial assets include trade debts, loan to related party, other receivables, bank balances and long-term deposits that derive directly from its operations.

The Company is exposed to market risk, credit risk and liquidity risk. The Company's senior management oversees the management of these risks. The Company's senior management is supported by a risk management committee that advises on financial risks and the appropriate financial risk governance framework for the Company. The risk management committee provides assurance to the Company's senior management that the Company's financial risk activities are governed by appropriate policies and procedures and that financial risks are identified, measured and managed in accordance with the Company's policies and risk objectives. The Board of Directors reviews and agrees policies for managing each of these risks, which are summarized below.

31.1 Market risk

Market risk is the risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in market prices. Market risk comprises three types of risk: interest rate risk, currency risk and other price risk, such as equity price risk and commodity risk.

The sensitivity analyses in the following sections relate to the position as at 30 June in 2020 and 2019.

The sensitivity analyses have been prepared on the basis that the amount of net debt, the ratio of fixed to floating interest rates of debt and the proportion of financial instruments in foreign currencies are all constant.

The analyses exclude the impact of movements in market variables on: the carrying values of pension and other post-retirement obligations; and provisions.

i) Foreign currency risk

Foreign currency risk is the risk that the fair value or future cash flows of an exposure will fluctuate because of changes in foreign exchange rates. Currency risk arises mainly from future commercial transactions or receivables and payables that exist due to transactions in foreign currencies. The Company's exposure to the risk of changes in foreign exchange rates relates primarily to the Company's operating activities (when revenue or expense is denominated in a foreign currency) and the Company's payments against foreign direct loans.

Following is the gross exposure classified into separate foreign currencies:

	2020	2019	2020	2019
	-----USD-----		-----Euros-----	
Long-term financing	231,913,422	283,449,738	-	-
Interest accrued on long term financing	4,430,001	6,616,196	-	-
Trade payables	27,360,328	44,875,000	739,093	739,093.00
	<u>263,703,751</u>	<u>334,940,934</u>	<u>739,093</u>	<u>739,093</u>

Significant exchange rates applied as at year end were as follows:

	2020	2019	2020	2019
	----USD----		----Euros----	
Rupees per foreign currency				
Reporting date rate	<u>168.76</u>	<u>164.50</u>	<u>189.73</u>	<u>186.99</u>
Average rate during the year	<u>166.63</u>	<u>143.05</u>	<u>188.36</u>	<u>164.28</u>

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Foreign currency sensitivity

The following tables demonstrate the sensitivity to a reasonably possible change in USD and Euros exchange rates, with all other variables held constant.

	Change in USD Rate	Effects on Profit Before Tax Rupees in thousands	Change in Euro Rate	Effects on Profit Before Tax Rupees in thousands
2020	+5%	2,225,000	+5%	7,011
	-5%	(2,225,000)	-5%	(7,011)
2019	+5%	2,754,889	+5%	6,910,150
	-5%	(2,754,889)	-5%	(6,910,150)

The Company's exposure to foreign currency changes for all other currencies is not material.

ii) Interest rate risk

Interest rate risk is the risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in market interest rates. The Company manages its interest rate risk by having a balanced portfolio of fixed and variable rate loans and borrowings.

At the reporting date the interest rate profile of the Company's interest-bearing financial assets/(liabilities) was as follow:

	2020 ---Rupees in thousands---	2019 ---Rupees in thousands---
Fixed rate instruments		
Long-term financing - foreign relent loans	133,854	133,854
Long-term financing - cash development loans	8,044,538	8,044,538
	<u>8,178,392</u>	<u>8,178,392</u>
Floating rate instruments		
Bank balances	10,166,613	6,105,556
Long-term financing - foreign direct loans	39,135,390	46,627,483
	<u>49,302,003</u>	<u>52,733,039</u>

Fair value sensitivity analysis for fixed rate instruments

The Company does not account for any fixed rate financial assets and liabilities at fair value through profit or loss. Therefore, a change in interest rates at the reporting date would not affect the profit or loss of the Company.

Cash flow sensitivity analysis for variable rate instruments

If interest rates at the year end date, fluctuates by 1% higher / lower with all other variables held constant, profit before taxation for the year would have been changed as following:

Changes in interest rate	2020 ---Rupees in thousands---	2019 ---Rupees in thousands---
+1%	<u>493,020</u>	<u>527,330</u>
-1%	<u>(493,020)</u>	<u>(527,330)</u>

This analysis is prepared, consistent from previous year, assuming the amounts of floating rate instruments outstanding at reporting date were outstanding for the whole year.

ii) Other price risk

Other price risk is the risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in market prices (other than those arising from currency risk or interest rate risk), whether those changes are caused by factors specific to the individual financial instrument or its issuer, or factors affecting all similar financial instruments traded in the market.

The Company is not exposed to any other price risks i.e. equity price risk and commodity price risk.

31.2 Credit risk

Credit risk is the risk that a counterparty will not meet its obligations under a financial instrument or customer contract, leading to a financial loss. The Company considers a financial asset in default when contractual payments are 30 days past due. However, in certain cases, the Company may also consider a financial asset to be in default when internal or external information indicates that the Company is unlikely to receive the outstanding contractual amounts in full before taking into account any credit enhancements held by the Company.

The management monitors and limits Company's exposure to credit risk through monitoring of client's credit exposure review and conservative estimates of expected credit loss, if any, and through the prudent use of collateral policy.

	2020	2019
	---Rupees in thousands---	
The maximum exposure to the credit risk at the reporting date was as follows:		
Bank balances	10,166,613	6,105,556
Trade debt	68,273,192	54,184,461
Long term deposits	281	281
Loan to related party	424,770	238,617
Other receivables	1,003,410	1,021,618
	<u>79,868,266</u>	<u>61,550,533</u>

i) Bank balances

Credit ratings both short-term and long-term of the banks along with the bank balances as of year end are as follows:

Bank	Rating			2020	2019	
	Short term	Long term	Agency			
					---Rupees in thousands---	
United Bank Limited	A-1+	AAA	JCR - VIS	2,030,486	903,250	
Habib Bank Limited	A-1+	AAA	JCR - VIS	1,818,064	968,208	
National Bank of Pakistan	A-1+	AAA	JCR - VIS	6,318,063	4,234,098	
					<u>10,166,613</u>	<u>6,105,556</u>

Due to the Company's long-standing business relationships with these financial institutions and after giving due consideration to their strong financial standing, the management does not expect non-performance by these counterparties on their obligations to the Company. Further, the Company has accessed that the ECL on bank balances is immaterial and hence, has not been recognized.

ii) Trade debt

The trade receivable is with the Company's sole customer i.e. CPPA-G, an associated company, age analysis of which is as follows:

	2020	2019
	----Rupees in thousands----	
Neither past due nor impaired		
Past due but not impaired		
0 to 3 Months (0 - 90 days)	15,055,000	30,611,556
4 to 6 Months (91 - 180 days)	13,908,805	14,850,482
7-12 Months	23,814,250	1,452,442
Over 12 Months	16,201,763	7,976,607
	<u>68,979,818</u>	<u>54,891,087</u>
	<u>68,979,818</u>	<u>54,891,087</u>

The Company has not recorded ECL against the balance receivable from CPPA-G, a government owned entity, in accordance with the exemption granted by SECP as disclosed in Note 4.12.

31.3 Liquidity risk

Liquidity risk is the risk that an entity will encounter difficulty in meeting obligations associated with financial liabilities.

The Company's approach to managing liquidity is to ensure, as far as possible, that it will always have sufficient liquidity to meet its liabilities when due, under both normal and stressed conditions, without incurring unacceptable losses or risking damage to the Company's reputation. Due to the support of the Federal Government, management believes the liquidity risk to be low.

The table below analyses the Company's financial liabilities into relevant maturity groupings based on the remaining period at the reporting date to the contractual maturity date. The amounts disclosed in the table are the contractual undiscounted cash flows. Balances due within 12 months equate to their carrying balances, as the impact of discounting is not significant.

	On demand	Less than 12 months	1 to 5 years	Over 5 years	Total
-----Rupees in thousands-----					
2020					
Long term financing	759,843	8,886,981	31,430,314	6,236,644	47,313,782
Trade and other payables	43,081	104,417,559	-	-	104,460,640
Interest accrued on long term financing	6,737,952	747,563	-	-	7,485,515
	<u>7,540,876</u>	<u>114,052,103</u>	<u>31,430,314</u>	<u>6,236,644</u>	<u>159,259,937</u>
2019					
Long-term financing	458,640	8,778,927	34,817,622	10,750,686	54,805,875
Trade and other payables	23,304	89,932,179	-	-	89,955,483
Interest accrued on long term financing	5,534,341	1,088,364	-	-	6,622,705
	<u>6,016,285</u>	<u>99,799,470</u>	<u>34,817,622</u>	<u>10,750,686</u>	<u>151,384,063</u>

Further, as at 30 June 2020, the Company is also contracted to pay interest on its long term financing. An estimate of interest in respect of the remaining terms of these loans is as follows:

	Rupees in thousands
Due in next year	2,575,432
Due after 1 year with in 5 years	6,250,295
Due after 5 years	5,586,603
	<u>14,412,330</u>

31.4 Financial instruments by categories

	2020 Financial assets at amortized cost	2019 Financial assets at amortized cost
----Rupees in thousands----		
Assets as per statement of financial position		
Bank balances	10,166,613	6,105,556
Trade debt	68,273,192	54,184,461
Long term deposits	281	281
Loan to related party	424,770	238,617
Other receivables	1,003,410	1,021,618
	<u>79,868,266</u>	<u>61,550,533</u>
Liabilities as per statement of financial position		
Long term financing	47,313,782	54,805,875
Trade and other payables	104,449,567	89,952,104
Interest accrued on long term financing	7,485,515	6,622,705
	<u>159,248,864</u>	<u>151,380,684</u>

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32. FAIR VALUE MEASUREMENTS**32.1 Fair value hierarchy**

The Company uses the following hierarchy for determining and disclosing the fair value of financial instruments by valuation techniques:

Level 1: quoted (unadjusted) prices in active markets for identical assets or liabilities;

Level 2: other techniques for which all inputs, which have a significant effect on the recorded fair value, are observable either, directly or indirectly; and

Level 3: techniques which use inputs that have a significant effect on the recorded fair value, that are not based on observable market data.

32.2 Fair value of financial instruments

The carrying values of all financial assets and liabilities reflected in the financial statements are stated at cost as the carrying amounts are a reasonable approximation of fair value.

As at 30 June 2020 and 2019, the Company did not hold any financial instrument carried at fair value.

32.3 Financial instruments by categories

	2020	2019
	Financial assets at amortized cost	Financial assets at amortized cost
	---Rupees in thousands---	
Assets as per statement of financial position		
Bank balances	10,166,613	6,105,556
Trade debt	68,273,192	54,184,461
Long term deposits	281	281
Loan to related party	424,770	238,617
Other receivables	1,003,410	1,021,618
	<u>79,868,266</u>	<u>61,550,533</u>
Liabilities as per statement of financial position		
Long term financing	47,313,782	54,805,875
Trade and other payables	104,449,567	89,952,104
Interest accrued on long term financing	7,485,515	6,622,705
	<u>159,248,864</u>	<u>151,380,684</u>

33. CAPITAL MANAGEMENT

The primary objective of the Company's capital management is to ensure that it maintains a strong credit rating and healthy capital ratios in order to support its business and maximize shareholders' value. The Company manages its capital structure and makes adjustments to it in the light of changes in economic conditions. The Board of Directors monitors the returns on capital, which the Company defines as net operating income divided by total shareholders' equity. The Company's objectives when managing capital are:

- to safeguard the entity's ability to continue as a going concern, so that it can continue to provide returns for shareholders and benefits for other stakeholders; and
- to provide an adequate return to shareholders by pricing products.

Consistent with the industry norms, the Company monitors its capital on the basis of gearing ratio. The ratio is calculated as net debt divided by total capital. Net debt is calculated as total borrowings and loans as shown in the balance sheet less cash and bank balances. Total capital is calculated as 'equity' as shown in the statement of financial position plus net debt (as defined above).

	2020	2019
	---Rupees in thousands---	
Long term financing	47,313,782	54,805,875
Less: Bank balances	(10,166,613)	(6,105,556)
Net debt	<u>37,147,169</u>	<u>48,700,319</u>
Total equity	(1,418,290)	(2,273,862)
Total capital employed	<u>35,728,879</u>	<u>46,426,457</u>
Gearing ratio	<u>104%</u>	<u>105%</u>

CENTRAL POWER GENERATION COMPANY LIMITED

The Company's strategy is to ensure compliance with the Prudential Regulations issued by the State Bank of Pakistan and is in accordance with agreements executed with financial institutions so that the total long term borrowings to equity ratio does not exceed the lender covenants. Breaches in meeting the financial covenants would permit the bank to immediately call loans and borrowings. There have been no breaches of the financial covenants of any interest-bearing loans and borrowing in the current period.

34. APPLICABILITY OF IFRS 16 "LEASES"

SECP, through its S.R.O. no.24(I)/2012 dated January 16, 2012 and S.R.O 986(I)/2019, dated September 02, 2019, exempted the application of IFRS - 16 (Leases) for power sector companies to the extent of the power purchase agreements (PPA) executed before the effective date of IFRS 16 i.e. 01 January 2019. The PPA for 747 MW plant is not yet executed, accordingly the Company will assess the applicability of IFRS - 16 with respect to this plant at the time of execution of PPA. However, SECP has made it mandatory to disclose the impact on the results of the application of IFRS - 16.

	2020	2019
	--- Rupees in thousands ---	
(Increase) / decrease in accumulated losses at the beginning of the year	(9,583,791)	2,665,960
Decrease in profit for the year - net	(1,079,513)	(12,249,751)
Increase in accumulated losses at the end of the year	(10,663,304)	(9,583,791)

The above disclosure is restricted to 747 MW plant, as impact for remaining rehabilitated plants is considered to be immaterial.

35. IMPACT OF NON-CAPITALIZATION OF EXCHANGE LOSS

SECP, through its S.R.O 986(I)/2019, dated September 2, 2019, exempted the power companies from application of IFRS - 9 to the extent of recognition of embedded derivative and IAS-21 to the extent of charging exchange losses (refer to Note 2 for details).

Had the IAS-21 been applied, following adjustments to the financial statement line items would have been made:

	Accumulated losses	Property, plant and equipment
	Decrease	Decrease
	---Rupees in thousands---	
Change due to non-capitalization of exchange loss as at 01 July 2018	(6,395,657)	6,395,657
Charge off of exchange loss for the year	(14,151,135)	14,151,135
Change due to non-capitalization of exchange loss as at 30 June 2019	(20,546,792)	20,546,792
Charge off of exchange loss for the year	(666,821)	666,821
Change due to non-capitalization of exchange loss as at 30 June 2020	(21,213,613)	21,213,613

36. PLANT CAPACITY AND ACTUAL PRODUCTION

	2020	2019
	-----MWh-----	
Based on 365 days		
Annual installed capacity - original	14,373,320	18,807,720
Actual output	5,921,761	9,384,298

36.1 Under utilization of available capacity is due to non-operational plants of the Company.

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CENTRAL POWER GENERATION COMPANY LIMITED

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	2020	2019
	-----Numbers-----	
37. NUMBER OF PERSONS EMPLOYED		
At the end of the year	<u>1,702</u>	<u>1,830</u>
Average number of employees during the year	<u>1,766</u>	<u>1,891</u>

38. GENERAL

Figures have been rounded off to the nearest thousands of Pak Rupees, unless otherwise stated.

39. DATE OF AUTHORIZATION

These financial statements have been authorized for issue by the Board of Directors of the Company on

04 MAR 2021



CHIEF EXECUTIVE



DIRECTOR

ANNEX-F

**ANNUAL RETURN FILED BY CPGCL BEFORE
THE SECURITY & EXCHANGE COMMISSION PAKISTAN FOR FY 2019-20**

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Form-A
(AGM for FY 2019-20)

THE COMPANIES ACT, 2017
THE COMPANIES (GENERAL PROVISIONS AND FORMS) REGULATIONS, 2018
[Section 130(1) and Regulation 4]

ANNUAL RETURN OF COMPANY HAVING SHARE CAPITAL

13/1/2022
26/4/21

PART-I

(Please complete in typescript or in bold block capitals.)

1.1 CUIN (Registration Number)

0	0	3	9	5	6	6
---	---	---	---	---	---	---

1.2 Name of the Company

Central Power Generation Company Limited
--

1.3 Fee Payment Details 1.3.1 Challan No

M-2021-282242

 1.3.2 Amount

Rs. 1,225/-

PART-II

1.4 Form A made up to dd mm yyyy

2	2	0	4	2	0	2	1
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1.5 Date of AGM

2	2	0	4	2	0	2	1
---	---	---	---	---	---	---	---

Section-A

2.1 Registered office address

197 - WAPDA House , Lahore

2.2 Email Address:

genco2_guddu@yahoo.com

2.3 Office Tel. No.:

042-99202611, 0722-679088, 0722-679450, 0722-691050

2.4 Office Fax No.:

042-99202107, 0722-679085

2.5 Principal line of business

Electric Power Generation

2.6 Mobile No. of Authorized officer
(Chief Executive / Director / Company Secretary / Chief Financial Officer)

0332-2704212 0315-9458859

2.7 Authorized Share Capital

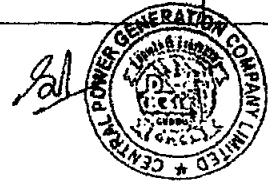
Classes and kinds of Shares	No. of Shares	Amount	Face Value
Ordinary Shares			
Ordinary Shares	5,000,000,000	50,000,000,000	Rs. 10-00

2.8 Paid up Share Capital

Classes and kinds of Shares	No. of Shares	Amount	Face Value
Ordinary Shares			
Ordinary Shares	50,000	500,000	Rs. 10-00

2.9 Particulars of the holding / subsidiary company, if any

Name of company	Holding/Subsidiary	% of shares held



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Form-A
(AGM for FY 2019-20)

2.10 Chief Executive Officer

Name	Mr. Sabeeh Uz Zaman Faruqi
Address	CPGCL Colony, TPS Guddu
NIC No	35201-7657263-7

2.11 Chief Financial Officer

Name	Mr. Muhammad Talal Chand
Address	CPGCL Colony, TPS Guddu
NIC No	41304-6471911-1

2.12 Secretary

Name	Mr. Muhammad Saad Shabbir
Address	House No. N-21, CPGCL Colony, TPS Guddu
NIC No	43104-6951824-3

2.13 Legal Advisor

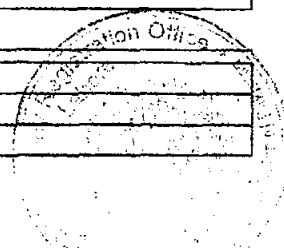
Name	Mr. Rizwan Falz Muhammad
Address	377 - A, Street 12, Sector E-11/4, Islamabad
NIC No	34101-9939142-3

2.14 Particulars of Auditor(s)

Name	Address
EY FORD RHODES	96-B-I, 4th Floor, Pace Mall Building, M.M Alam Road, Gulberg-II, P.O. Box 104, Lahore

2.15 Particulars of Share Registrar (if applicable)

Name	
Address	
e-mail	

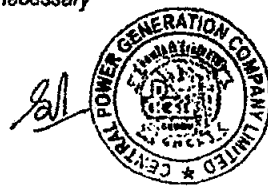


Section-B

2.16 List of Directors as on the date annual return is made

S#	Name	Residential Address	Nationality	NIC No. (Passport No. if foreigner)	Date of appointment or election
1.	Mr. Sabeeh Uz Zaman Faruqi	CPGCL Colony, TPS Guddu	Pakistani	35201-7657263-7	14/04/2021
2.	Syed Tahir Nawazish	72 V Street 2, DHA, Lahore	Pakistani	35200-1603326-1	08/02/2019
3.	Mr. Muhammad Imran	GHCL, 1 st Floor, OPF Building, Sector G-5/2, Shahr-e-Jamhoriat, Islamabad	Pakistani	35201-1417843-1	08/02/2019
4.	Mr. Abdul Qayum Malik	House No. 76-GG, Defense Housing Authority, Lahore	Pakistani	34803-7031390-5	08/02/2019
5.	Mr. Muhammad Aslam Shaikh	Fiat No. 029/C2, Phase-II, Haroon Royal City, Gulletan-e-Johar, Block-17, Karachi	Pakistani	42201-6389005-3	08/02/2019
6.	Mr. Mahfooz Ahmed Bhatti	House No.12-G, School Road, Sector F-6/3, Islamabad	Pakistani	42301-0344153-3	02/10/2020

Use separate sheet, if necessary



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Form-A
(AGM for FY 2019-20)

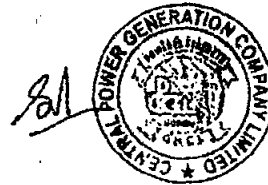
2.17 List of members & debenture holders on the date upto which this Form is made

S#	Folio	Name	Address	Nationality	No. of shares	NIC (Passport No. if foreigner)
Members						
1	46	Syed Tahir Nawazish	72 V Street 2, DHA, Lahore	Pakistani	1	35200-1503326-1
2	47	Mr. Muhammad Aslam Sheikh	Flat No. 029/C2, Phase-II, Haroon Royal City, Gulistan-e-Johar, Block-17, Karachi	Pakistani	1	42201-6389005-3
3	48	Mr. Abdul Qayum Malik	House No. 76-GG, Defense Housing Authority, Lahore	Pakistani	1	34803-7031390-5
4	52	Mr. Muhammad Imran Mian	GHCL, 1st Floor, OPF Building, Sector G-6/2, Shahr-e-Jamhoriat, Islamabad	Pakistani	1	35201-1417843-1
5	55	Mr. Arhsad Mahmood	House No. 18, Club Road, GOR-I Lahore	Pakistani	1	35202-7783745-3
6	58	Mr. Mahfooz Ahmed Bhatti	House No.12-G, School Road, Sector F-6/3, Islamabad	Pakistani	1	42301-0344153-3
7	67	Mr. Sabeeh Uz Zaman Faruqi	CPGCL Colony, TPS Guddu	Pakistani	1	35201-7557263-7
8	16	President of Islamic Republic of Pakistan	Islamabad	Pakistani	49,993	
			Total		50,000	
Debenture holders						

Use separate sheet, if necessary

2.18 Transfer of shares (debentures) since last Form A was made				
S#	Name of Transferor	Name of Transferee	Number of shares transferred	Date of registration of transfer
Members				
1	Mr. Hammad Amer Hashmi	Mr. Sabeeh Uz Zaman Faruqi	01	14/04/2021
Debenture holders				

Use separate sheet, if necessary



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PART-III

3.1 Declaration:

I do hereby solemnly, and sincerely declare that the information provided in the form is:

- (i) true and correct to the best of my knowledge, in consonance with the record as maintained by the Company and nothing has been concealed; and
- (ii) hereby reported after complying with and fulfilling all requirements under the relevant provisions of law, rules, regulations, directives, circulars and notifications whichever is applicable.

3.2 Name of Authorized Officer with designation/
Authorized Intermediary

MUHAMMAD SAAD SHABBIR
Company Secretary

3.3 Signatures

Shabbir 

3.4 Registration No of Authorized Intermediary, if applicable

CERTIFIED TO BE TRUE COPY OF THE DOCUMENT
FILED BY THE COMPANY HOWEVER THIS OFFICE
ACCEPTS NO RESPONSIBILITY AS TO THE
CORRECTNESS OF THE DETAILS GIVEN
IN THE DOCUMENT

Day	Month	Year
2 2	0 4	2 0 2 1

3.5 Date

INSTRUCTIONS FOR FILING FORM-A
ADDITIONAL REGISTRAR OF COMPANIES
COMPANY REGISTRATION OFFICE

1. The Form shall be made up to the date of last AGM of the Company or the last date of the calendar year where no AGM is held during the year.
2. Under S. No.2.17 above, the aggregate number of shares held by each member should be stated.
3. When the shares are of different classes the columns should be subdivided so that the number of each class held, is shown separately against S. Nos. 2.7, 2.8 and 2.17
4. If the space provided in the Form is insufficient, the required information should be listed in a separate statement attached to this return which should be similarly signed.
5. In case a body corporate is a member, registration number may be mentioned instead of NIC number.
6. In case of foreign nationals, indicate "passport number" in the space provided for "NIC No." Pakistani nationals will only indicate "NIC No."
7. This form is to be filed within 30 days of the date indicated in S.No.1.4.

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ANNEX-G

CHARGES OR ENCUMBRANCES TO THE CPGCL'S ASSETS

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B 035943

SECURITIES AND EXCHANGE COMMISSION OF PAKISTAN

CERTIFICATE OF REGISTRATION OF MORTGAGE, ETC

[Under section 100(3) of the Companies Act, 2017 (XIX of 2017)]

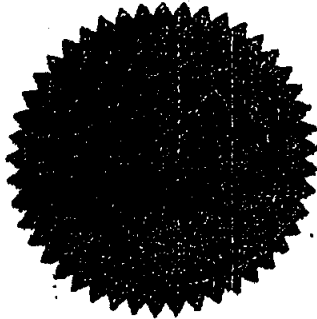
Corporate Universal Identification No.0039566

Mortgage or Charge dated 01-03-2019 made between **CENTRAL POWER GENERATION COMPANY LIMITED** of the one part and **MEEZAN BANK LIMITED, MEEZAN HOUSE, C-25, ESTATE AVENUE, S.I.T.E, KARACHI** the other part:

Pursuant to the provisions contained in section 100 of the Companies Act, 2017 (XIX of 2017), I hereby certify that the above mortgage or charge for **Rs.200,000,000,000/- (Rupees Two Hundred Billion Only)** has been registered in this office in accordance with the provisions of sections 100 to 101 of the said Act.

Given under my hand at Lahore this 07th day of November Two Thousand and Nineteen.

Fee: Rs.7,500/-



(Handwritten Signature)
(USMAN SAEED)
Assistant Registrar of Companies
Lahore

No:ARL/ 7956

DATED: - 07-11-2019.

04 NOV 2019

THE COMPANIES ACT, 2017
 THE COMPANIES (GENERAL PROVISIONS AND FORMS) REGULATIONS, 2018
 [Sections 100, 105 & 448 and Regulations 4 & 18]

PARTICULARS OF MORTGAGES, CHARGES, PLEDGE, ETC.

PART-I

(Please complete in typescript or in bold block capitals.)

1.1 CUIIN (Registration Number) **0 0 3 9 5 6 6**

1.2 Name of the Company **Central Power Generation Company Limited**

1.3	Fee Payment Details	1.3.1	Challan No.	M-2019-031914	1.3.2	Amount	7,525/-
-----	---------------------	-------	-------------	---------------	-------	--------	---------

PART-II

- 2.1 Particulars of mortgage, charge, pledge etc. created by the company:
- a. a mortgage or charge on any immovable property whether leasehold or freehold, or any interest therein; or
 - b. a mortgage or charge for the purposes of securing any loan or debentures;
 - c. a mortgage or charge on book debts of the company;
 - d. a floating charge on the undertaking or property of the company, including stock-in-trade; or
 - e. a charge on a ship or aircraft, or any share in a ship or aircraft;
 - f. a charge on goodwill or on any intellectual property;
 - g. a mortgage or charge or pledge, on any movable property of the company;
 - h. a mortgage or charge or other interest, based on agreement for the issue of any instrument in the nature of redeemable capital; or
 - i. a mortgage or charge or other interest, based on conditional sale agreement, namely, lease financing, hire-purchase, sale and lease back, and retention of title, for acquisition of machinery, equipment or other goods



(Tick the appropriate box)

2.2 Date of Instrument

dd	mm	Yyyy
0 1	0 3	2 0 1 9

2.3 Description of the Instrument (if any) creating or evidencing the mortgage or charge or pledge or other interest (to be specified).
 Authorization and Interest Agreement dated March 1, 2019.

2.4 Amount secured by the mortgage or charge, pledge etc.
 PKR 200,000,000,000/-

2.5 Short particulars of the property mortgaged, charge, pledge or other interest
 As per Schedule-1 attached hereto.

Sal

2.6 Gist of the terms and conditions and extent and operation of the mortgage, charge, pledge or other interest

Power Holding (Private) Limited ("PHPL") is authorized to use and sell the beneficial ownership of the Relevant Transaction Assets to the Investment Agent for the purposes of raising financing in the form of the Sukuk Issue

The Company authorizes PHPL to use the Relevant Transaction Assets for the purposes of the Sukuk Issue by entering into a co-ownership transaction with the Investment Agent in respect of selling ownership of the Relevant Transaction Assets to the investment Agent for the benefit of the Sukuk Investors.

The Company shall continue to hold the legal title of the Relevant Transaction Assets on behalf of and for the benefit of the Investment Agent and Sukuk Investors for the purposes of the Sukuk Issue.

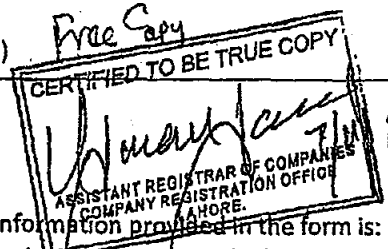
The Company confirms that as contemplated under this Agreement, an interest in the Relevant Transaction Assets shall be created in favor of the Investment Agent, which interest shall constitute an interest for the purposes of Section 100 of the Companies Act, 2017.



(Also include description of the nature of the mortgage/charge e.g. equitable, pari-passu, etc.)

2.7 Names, addresses and description of the mortgagees or persons entitled to the charge or other interest.

MEEZAN BANK LIMITED
 Meezan House, C-25, Estate Avenue, S.I.T.E., Karachi
 (As Trustee)



PART-III

3.1 Declaration:

I do hereby solemnly, and sincerely declare that the information provided in the form is:
 (i) true and correct to the best of my knowledge, in consonance with the record as maintained by the Company and nothing has been concealed; and
 (ii) hereby reported after complying with and fulfilling all requirements under the relevant provisions of law, rules, regulations, directives, circulars and notifications whichever is applicable.

3.2 Name of Authorized Officer with designation/ Authorized Intermediary

MUHAMMAD SAAD SHABBIR
 Company Secretary

3.3 Signatures

Shabbir [Signature]

3.4 Registration No of Authorized Intermediary, if applicable

[Blank registration number field]

3.5 Date

Day		Month		Year			
0	1	0	3	2	0	1	9

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ANNEX-H

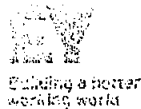
CPGCL'S LATEST AUDITED FINANCIAL STATEMENTS



Building a better
working world

CENTRAL POWER GENERATION COMPANY LIMITED

**FINANCIAL STATEMENTS
FOR THE YEAR ENDED 30 JUNE 2020**



EY Fird Rhodes
Chartered Accountants
98-B-1, 4th Floor, Park Mall Building
M. M. Alam Road, Gulberg-2
P.O. Box 104, Lahore-54880

Tel: +9241 3577 8402-11
Fax: +9241 3577 8412-13
ey.fhr@pk.ey.com
ey.com/pk

(14)

INDEPENDENT AUDITOR'S REPORT

To the members of Central Power Generation Company Limited

Report on the audit of the financial statements

Qualified Opinion

We have audited the annexed financial statements of **Central Power Generation Company Limited** (the Company), which comprise the statement of financial position as at 30 June 2020, and the statement of profit or loss, the statement of comprehensive income, the statement of changes in equity, the statement of cash flows for the year then ended, and notes to the financial statements, including a summary of significant accounting policies and other explanatory information, and we state that we have obtained all the information and explanations which, to the best of our knowledge and belief, were necessary for the purposes of the audit.

In our opinion and to the best of our information and according to the explanations given to us, except for the effects of the matter described in the Basis for Qualified Opinion section of our report, the statement of financial position, statement of profit or loss, statement of comprehensive income, the statement of changes in equity and the statement of cash flows together with the notes forming part thereof conform with the accounting and reporting standards as applicable in Pakistan and give the information required by the Companies Act, 2017 (XIX of 2017), in the manner so required and, except for the effects of the matter described in the Basis for Qualified Opinion section of our report, respectively give a true and fair view of the state of the Company's affairs as at 30 June 2020 and of the profit and total comprehensive income, the changes in equity and its cash flows for the year then ended.

Basis for Qualified Opinion

As disclosed in Note 22.1.3 to the financial statements, the Company has not recognized a liability for its obligation to pay Interest / Late Payment Surcharge (LPS) on late payments for the natural gas supplied by Mari Petroleum Company Limited (MPCL) and Pakistan Petroleum Limited (PPL) under the signed gas sales term sheet and gas sale agreements, respectively. Further, as explained in the aforementioned note, the Company has claimed LPS from Central Power Purchasing Agency (Guarantee) Limited (CPPA-G) due to delayed payments by CPPA - G relating to supply of electricity, which has also not been recognized as receivable.

Had the Company recognized the LPS expense under the gas sales term sheet / gas sale agreements with MCL and PPL, and LPS income from the CPPA-G, the Company's trade and other payable, trade debts and tax refunds due from the Government as at 30 June 2020 would have been higher by Rs. 22,089,808 thousand, Rs. 18,062,870 thousand and Rs. 1,213,015 thousand respectively, and accumulated losses as at 30 June 2019 would be higher by Rs. 3,201,484 thousand, finance cost, finance income and taxation for the year ended 30 June 2020 would have been higher by Rs. 6,628,555 thousand, Rs. 7,174,415 thousand and Rs. 158,300 thousand respectively and accordingly, profit after tax for the year ended 30 June 2020 would have been higher by Rs. 387,560 thousand.

We conducted our audit in accordance with International Standards on Auditing (ISAs) as applicable in Pakistan. Our responsibilities under those standards are further described in the Auditors' Responsibilities for the Audit of the Financial Statements section of our report. We are independent of the Company in accordance with the International Ethics Standards Board for Accountants' Code of Ethics for Professional Accountants as adopted by the Institute of Chartered Accountants of Pakistan (the Code) and we have fulfilled our other ethical responsibilities in accordance with the Code. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our qualified opinion.

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Information Other than the Financial Statements and Auditors' Report Thereon

Management is responsible for the other information. The other information comprises the information included in the Directors' Report, but does not include the financial statements and our auditors' report thereon.

Our opinion on the financial statements does not cover the other information and we do not express any form of assurance conclusion thereon.

In connection with our audit of the financial statements, our responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the financial statements or our knowledge obtained in the audit or otherwise appears to be materially misstated. If, based on the work we have performed, we conclude that there is a material misstatement of this other information, we are required to report that fact. As described in the Basis for Qualified Opinion section above, the Company has not recognized a liability for its obligation to pay interest / LPS on late payments for the natural gas supplied by MPCL and PPL under the signed gas sales term sheet and gas sale agreements, respectively. Further, the Company has claimed LPS from CPPA-G due to delayed payments by CPPA - G relating to supply of electricity, which has also not been recognized as receivable. We have concluded that the other information is materially misstated with respect to the amounts or other items as described in the Basis for Qualified Opinion section above.

Responsibilities of Management and Board of Directors for the Financial Statements

Management is responsible for the preparation and fair presentation of the financial statements in accordance with the accounting and reporting standards as applicable in Pakistan and the requirements of Companies Act, 2017 (XIX of 2017) and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is responsible for assessing the Company's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Company or to cease operations, or has no realistic alternative but to do so.

Board of Directors are responsible for overseeing the Company's financial reporting process.

Auditor's Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditors' report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with ISAs as applicable in Pakistan will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

As part of an audit in accordance with ISAs as applicable in Pakistan, we exercise professional judgment and maintain professional scepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.

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- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Company's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditors' report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditors' report. However, future events or conditions may cause the Company to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

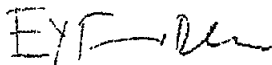
We communicate with the Board of Directors regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

Report on Other Legal and Regulatory Requirements

Based on our audit, we further report that in our opinion:

- a) except for the effects of the matter described in the basis for qualified opinion section of our report, proper books of account have been kept by the Company as required by the Companies Act, 2017 (XIX of 2017);
- b) except for the effects of the matter described in the basis for qualified opinion section of our report, the statement of financial position, the statement of profit or loss, the statement of comprehensive income, the statement of changes in equity and the statement of cash flows together with the notes thereon have been drawn up in conformity with the Companies Act, 2017 (XIX of 2017) and are in agreement with the books of account and returns;
- c) investments made, expenditure incurred and guarantees extended during the year were for the purpose of the Company's business; and
- d) no zakat was deductible at source under the Zakat and Ushr Ordinance, 1980 (XVIII of 1980).

The engagement partner on the audit resulting in this independent auditors' report is Sajjad Hussain Gill.



Chartered Accountants
Place: Lahore
Date: 18 March 2021

CENTRAL POWER GENERATION COMPANY LIMITED
STATEMENT OF FINANCIAL POSITION
AS AT 30 JUNE 2020

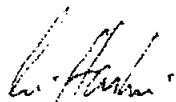
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<u>ASSETS</u>	Note	2020 -----Rupees in thousands-----	2019
Non-current assets			
Property, plant and equipment	5	101,901,574	105,871,790
Long term advances	6	51,655	49,159
Long term deposits		281	281
		<u>101,953,510</u>	<u>105,921,230</u>
Current assets			
Stores, spare parts and loose tools	7	3,633,585	2,331,233
Stock-in-trade	8	928,352	928,352
Trade debt	9	68,273,192	54,184,461
Advances, loan and prepayments	10	1,029,902	3,434,548
Other receivables	11	1,003,410	1,021,618
Tax refunds due from the Government	12	4,262,523	4,002,824
Bank balances	13	10,166,613	6,105,556
		<u>89,297,577</u>	<u>72,008,592</u>
TOTAL ASSETS		<u><u>191,251,087</u></u>	<u><u>177,929,822</u></u>
<u>EQUITY AND LIABILITIES</u>			
SHARE CAPITAL AND RESERVES			
Share Capital			
Authorized share capital			
5,000,000,000 (2019: 5,000,000,000) ordinary shares of Rs.10 each			
		<u>50,000,000</u>	<u>50,000,000</u>
Issued, subscribed and paid-up share capital			
	14	500	500
Accumulated losses			
		<u>(4,762,709)</u>	<u>(5,618,281)</u>
		<u>(4,762,209)</u>	<u>(5,617,781)</u>
Deposit for shares			
	15	3,343,919	3,343,919
		<u>(1,418,290)</u>	<u>(2,273,862)</u>
Non-current liabilities			
Long term financing	16	37,666,958	45,568,309
Deferred taxation - net	17	2,309,764	994,316
Deferred grant	18	198,591	397,181
Staff retirement benefits	19	30,901,085	27,428,124
		<u>71,076,398</u>	<u>74,387,930</u>
Current liabilities			
Trade and other payables	20	104,460,640	89,955,483
Interest accrued on long term financing	21	7,485,615	6,622,705
Current portion of long term financing	16	9,646,824	9,237,566
		<u>121,592,979</u>	<u>105,815,754</u>
		<u><u>191,251,087</u></u>	<u><u>177,929,822</u></u>

CONTINGENCIES AND COMMITMENTS

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The annexed notes from 1 to 39 form an integral part of these financial statements.



CHIEF EXECUTIVE



DIRECTOR


CENTRAL POWER GENERATION COMPANY LIMITED
 STATEMENT OF PROFIT OR LOSS
 FOR THE YEAR ENDED 30 JUNE 2020

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		2020	2019
	Note	---Rupees in thousands---	
Revenue from contract with customer - net	23	68,405,062	78,735,612
Cost of revenue	24	(61,780,426)	(68,561,713)
Gross profit		6,624,636	10,173,899
Administrative expenses	25	(979,446)	(1,493,054)
Operating profit		5,645,191	8,680,845
Other income	26	530,583	487,189
Finance costs	27	(3,033,294)	(4,173,593)
Profit before taxation		3,142,480	4,994,441
Taxation	28	(1,932,924)	(1,477,599)
Profit for the year		1,209,536	3,516,842

The annexed notes from 1 to 39 form an integral part of these financial statements.

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CHIEF EXECUTIVE



DIRECTOR

CENTRAL POWER GENERATION COMPANY LIMITED
 STATEMENT OF COMPREHENSIVE INCOME
 FOR THE YEAR ENDED 30 JUNE 2020

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	2020	2019
Note	---Rupees in thousands---	
Profit for the year	1,209,538	3,516,842
Other comprehensive income:		
<i>Items not to be reclassified to profit or loss in subsequent periods:</i>		
Re-measurement loss on defined benefit plans	19.3 (498,541)	(1,909,683)
Related tax effects	144,577	324,646
Other comprehensive loss for the year - net of tax	(353,964)	(1,585,037)
Total comprehensive income for the year	855,572	1,931,805

The annexed notes from 1 to 39 form an integral part of these financial statements

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CHIEF EXECUTIVE



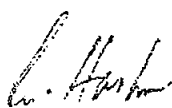
DIRECTOR

CENTRAL POWER GENERATION COMPANY LIMITED
STATEMENT OF CASH FLOWS
FOR THE YEAR ENDED 30 JUNE 2020

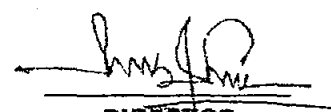
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	2020	2019
Note	---Rupees in thousands---	
CASH FLOWS FROM OPERATING ACTIVITIES		
Profit before taxation	3,142,460	4,994,441
Adjustments to reconcile profit before tax to net cash flows:		
Depreciation	5,713,922	4,887,505
Amortization of deferred grant	(198,590)	(198,590)
Provision for staff benefits - net	4,111,237	2,682,282
Profit on bank deposits	(273,556)	(140,123)
Finance cost	3,033,294	3,354,619
Exchange loss	-	818,974
Reversal of NRV adjustment on stock in trade	-	(58,164)
	<u>12,386,307</u>	<u>11,346,503</u>
Cash flows before working capital changes	16,528,767	16,340,944
(Increase) / decrease in current assets:		
Stores, spare parts and loose tools	(1,302,352)	(246,487)
Stock-in-trade	-	273
Trade debt	(14,088,731)	(41,193,784)
Advances	2,404,646	(1,714,089)
Other receivables	18,208	(23,187)
Tax refunds due from the Government	(732,598)	(29,427)
	<u>(13,700,827)</u>	<u>(43,206,701)</u>
Increase in current liabilities:		
Trade and other payables	14,478,737	39,591,511
Cash generated from operations	<u>16,306,677</u>	<u>12,725,754</u>
Finance cost paid	(2,148,386)	(2,024,415)
Staff benefits paid	(1,136,817)	(885,208)
	<u>(3,285,203)</u>	<u>(2,909,623)</u>
Net cash generated from operating activities	13,021,474	9,816,131
CASH FLOWS FROM INVESTING ACTIVITIES		
Capital expenditure - net	(1,076,885)	(229,229)
Increase in long term advances	(2,496)	(152)
Profit on bank deposits received	273,556	140,123
Net cash used in investing activities	<u>(806,825)</u>	<u>(89,258)</u>
CASH FLOWS FROM FINANCING ACTIVITIES		
Repayment long-term financing - net	(8,154,692)	(6,908,184)
Net increase in cash and cash equivalents	4,061,057	2,818,689
Cash and cash equivalents at the beginning of the year	6,105,556	3,286,867
Cash and cash equivalents at the end of the year	<u>10,166,613</u>	<u>6,105,556</u>
NON-CASH INVESTING ACTIVITIES		
Capitalization of exchange loss	(666,821)	(14,328,740)

The annexed notes from 1 to 39 form an integral part of these financial statements.



CHIEF EXECUTIVE



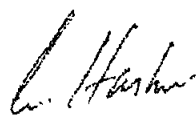
DIRECTOR

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CENTRAL POWER GENERATION COMPANY LIMITED
STATEMENT OF CHANGES IN EQUITY
FOR THE YEAR ENDED 30 JUNE 2020

	Share capital	Revenue Reserve - Accumulated losses	Total
Note	----- Rupees in thousands -----		
Balance as at 01 July 2018	500	(7,550,086)	(7,549,586)
Profit for the year	-	3,516,842	3,516,842
Other comprehensive loss for the year	-	(1,585,037)	(1,585,037)
Total comprehensive income for the year	-	1,931,805	1,931,805
Balance as at 30 June 2019	500	(5,618,281)	(5,617,781)
Profit for the year	-	1,209,536	1,209,536
Other comprehensive loss for the year	-	(353,964)	(353,964)
Total comprehensive income for the year	-	855,572	855,572
Balance as at 30 June 2020	500	(4,762,709)	(4,762,209)

The annexed notes from 1 to 39 form an integral part of these financial statements.



CHIEF EXECUTIVE



DIRECTOR

CENTRAL POWER GENERATION COMPANY LIMITED
NOTES TO THE FINANCIAL STATEMENTS
FOR THE YEAR ENDED 30 JUNE 2020

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1 THE COMPANY AND ITS ACTIVITIES

1.1 Central Power Generation Company Limited (the Company) was incorporated on 26 October 1998 as a public limited company under the Companies Act, 2017, with its registered office situated at 185, WAPDA House, Shahrah-e-Quaid-e-Azam, Lahore. The Company was formed to acquire all the properties, assets and liabilities of Thermal Power Station (TPS) Guddu, TPS Sukkur and TPS Quetta from Water And Power Development Authority (WAPDA). The Company's main objective is the generation and sale of electricity.

1.2 Business transfer agreement

The Company took over certain properties, assets, rights, obligations and liabilities relating to generation of electricity from WAPDA under a Business Transfer Agreement (BTA) dated 02 March 1999. The details of assets, liabilities and related matters as provided under clause 1.1 of the BTA have been finalized with WAPDA through a Supplementary Business Transfer Agreement (SBTA). However, according to clause 10-A(iii) of SBTA, the BTA will be effective upon execution of agreements relating to the loans / liabilities assumed by the Company as a consequence of the BTA, which is still in process.

1.3 Geographical location of head office and business units

- The head office of the Company is situated at TPS Guddu, District Kashmore, Sindh.
- The location, installed capacity, operational status and generation license granted by National Electric Power Regulatory Authority (NEPRA) under section 15 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997, through license no. GL/02/2002 dated 01 July 2002 and subsequently through modification dated 10 July 2019 of the power plants of the Company are as follows:

Thermal Power Stations (TPS)	Block	Installed capacity (MW)	Status	Generation licence upto
TPS Guddu	Block I	415.00	Operational	2024
	Block II	600.00	Operational	2023
	Block III	420.00	Non-operational	-
	Block IV	220.00	Non-operational	-
	Block V	776.70	Operational	2042
TPS Sukkur	-	50.00	Non-operational	-
TPS Quetta	-	50.94	Non-operational	2029
		2,532.64		

1.4 Impact of COVID-19 on the financial statements

The World Health Organization declared COVID-19 a global pandemic on 11 March 2020. Accordingly, on 20 March 2020, the Government of Pakistan announced temporary lock down as a measure to reduce the spread of COVID-19. The outbreak of COVID-19 has had a distressing impact on overall demand in the global economy with notable downgrade in growth forecasts.

The Company's management is fully cognizant of the business challenges posed by the COVID-19 outbreak and closely monitoring the possible impacts on the Company's operations and liquidity positions and believes that its current policies for managing credit, liquidity and market risk are adequate in response to current situation.

Further, subsequent to year end, the situation is improved with the easing of lock down and re-opening of the businesses.

The management has assessed the impact of the COVID-19 on the financial statements and concluded that there is no material financial impact of COVID-19 on the carrying amounts of assets, liabilities, income or expenses which required specific disclosures.

2. STATEMENT OF COMPLIANCE

These financial statements have been prepared in accordance with the accounting and reporting standards as applicable in Pakistan. The accounting and reporting standards applicable in Pakistan comprise of:

- International Financial Reporting Standards (IFRSs) issued by the International Accounting Standards Board (IASB) as notified under the Companies Act, 2017;
- Provisions of and directives issued under the Companies Act, 2017.

Where provisions of and directives issued under the Act, differ from the IFRSs, the provisions of and directives issued under the Companies Act, 2017 have been followed.

Securities and Exchange Commission of Pakistan's (SECP) through its S.R.O. no.24(I)/2012 dated January 16, 2012 and S.R.O 986(I)/2019, dated September 02, 2019, has granted exemption from requirements of International Financial Reporting Standards ("IFRS") to all companies that have executed their power purchase agreements before 01 January 2019 as follows:

- a) IFRS 16 (Leases) to the extent of the power purchase agreements executed before the effective date of IFRS 16 i.e. 01 January 2019;
- b) International Accounting Standard 21 (The Effects of Changes in Foreign Exchange Rates) to the extent of capitalization of exchange differences; and
- c) In case of capitalization of exchange differences under (b) above, recognition of embedded derivative under IFRS 9 (Financial Instruments) shall not be permitted.

Related disclosures applicable due to departure of above IFRS requirements are stated in Note 34 and 35 to the financial statements.

3. BASIS OF MEASUREMENT**3.1 Accounting convention**

These financial statements have been prepared under the historical cost convention unless other wise stated.

3.2 Functional and presentation currency

These financial statements are presented in Pak Rupee which is the Company's functional currency. Amounts presented in the financial statements have been rounded off to the nearest thousand of Rupees, unless otherwise stated.

3.2 Significant accounting estimates and judgments

The preparation of financial statements in conformity with approved accounting standard requires the use of certain critical accounting estimates. It also requires management to exercise its judgment in the application of Company's accounting policies. Estimates and judgments are continually evaluated and are based on historical experiences, including expectations of future events that are believed to be reasonable under the circumstances. The areas involving a higher degree of judgment or complexity or areas where assumptions and estimates are significant to the financial statements are documented in the following accounting policies and notes, and relate primarily to:

	Note
a) Useful life and depreciation method of fixed assets	4.2 & 5
b) Provision against obsolete / slow moving inventories	4.3, 7 & 8
c) Obligation of defined benefit obligation	4.10 & 19
d) Current income tax expense, provision for current tax and recognition of deferred tax asset (for carried forward tax losses)	4.15, 12, 17 & 28
e) Provisions	4.17
d) Revenue from contract with customer	4.11 & 23

4. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

4.1 Standards, interpretations and amendments to published approved accounting standards those are effective in current year

The accounting policies adopted in the preparation of these financial statements are consistent with those of the previous financial year except as described below:

IFRS 16 - Leases

IAS 19 - Plan Amendment, Curtailment or Settlement (Amendments)

IAS 28 - Long-term Interests in Associates and Joint Ventures - (Amendments)

IFRIC 23 - Uncertainty over Income Tax Treatments

IFRS 3 - Business Combinations - Previously held interests in joint operation - (Amendments)

IFRS 11 - Joint Arrangements - Previously held interests in a joint operation - (AIP)

IAS 23 - Borrowing Costs - Borrowing costs eligible for capitalization

IFRS 9 - Prepayment Features with Negative Compensation - (Amendments)

IAS 12 - Income Taxes - Income tax consequences of payments on financial instruments classified as equity

IFRS - 14 - Regulatory Deferral Accounts

The adoption of the above standards, amendments, improvements to accounting standards and interpretations did not have any material impact on the financial statements except for IFRS 16. However, the Company has availed the exemption granted by SECP as described in Note 2 to the financial statements.

4.2 Property, plant and equipment

a) Cost

Items of property, plant and equipment are stated at cost less accumulated depreciation and impairment loss, if any, except for freehold land, which is stated at cost. Cost of operating fixed assets comprises historical cost and other expenditure pertaining to the acquisition, construction, erection and installation of these assets.

Subsequent costs are included in the asset's carrying amount or recognized as a separate asset, as appropriate, only when it is probable that future economic benefits associated with the item will flow to the Company and the cost of the item can be measured reliably. Major overhauling and improvements are capitalized, while all other repair and maintenance costs are charged to statement of profit or loss during the year in which they are incurred.

Further, as described in Note 4.19 to the financial statements, exchange gains and losses on long term foreign currency loans utilized for acquisition of assets are added to/deducted from cost of property, plant and equipment.

b) Depreciation

Depreciation on property, plant and equipment is charged to statement of profit or loss on straight line method so as to write off the carrying amount of an asset over its estimated useful life at the rates given in Note 5.1 to the financial statements. Depreciation charge commences from the month in which asset is available for use and no depreciation is charged in the month of disposal.

Spare parts and servicing equipment are classified as property, plant and equipment under plant and machinery rather than stores, spare parts and loose tools when they meet the definition of property, plant and equipment. Available for use capital spares and servicing equipment are depreciated over their useful lives, or the remaining life of principal asset, whichever is lower.

Judgment and estimates

The useful lives, residual values and depreciation method are reviewed on a regular basis. The effect of any changes in estimate is accounted for on a prospective basis.

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c) Derecognition

An item of property, plant and equipment is derecognized upon disposal or when no future economic benefits are expected from its use or disposal. Any gain or loss arising on derecognition of the asset (calculated as the difference between the net disposal proceeds and carrying amount of the asset) is included in the statement of profit or loss in the year during which the asset is derecognized.

d) Impairment of assets

The Company assesses at each statement of financial position date whether there is any indication that assets excluding inventory may be impaired. In making these assessment, the Company uses the technical resources available inside/outside the Company, as appropriate. If such indication exists, the carrying amounts of such assets are reviewed to assess whether they are recorded in excess of their recoverable amounts. Where the carrying value exceeds the recoverable amount, assets are written down to the recoverable amount and the difference is charged to the statement of profit or loss

e) Capital work-in-progress

Capital work-in-progress represents expenditure on property, plant and equipment which are in the course of construction and installation. Transfers are made to relevant property, plant and equipment category as and when assets are available for use.

Capital work-in-progress is stated at cost less any identified impairment loss.

4.3 Inventories**a) Stores, spares parts and loose tools**

These are valued at lower of cost, determined on weighted average basis, and net realizable value. Cost represents the invoice values directly attributable thereon. Provision is made for obsolete and slow moving items, if any.

Net realizable value is the estimated selling price in the ordinary course of business, less estimated costs of completion and the estimated costs necessary to make the sale.

b) Stock-in-trade

Stock-in-trade are valued at lower of cost, determined on weighted average basis, and net realizable value.

Materials-in-transit are stated at cost. Cost of items-in-transit represents the invoice value plus other charges incurred thereon till the reporting date.

Net realizable value signifies the estimated selling price in the ordinary course of business less cost necessary to make the sale. Provision is made for obsolete stock-in-trade, if any.

Judgment and estimates

Inventory write-down is made based on the current market conditions, historical experience and selling goods of similar nature. It could change significantly as a result of changes in market conditions. A review is made on each reporting date for excess inventories, obsolescence and declines in net realizable value and a provision is recorded against the inventory balances for any such declines.

4.4 Trade debts

Trade debts are initially measured at their transaction price under IFRS 15 and subsequently measured at amortized cost less any allowance for expected credit losses.

4.5 Cash and cash equivalents

Cash and cash equivalents are carried at amortized cost and comprise cash at banks in current and deposit

4.6 Loan, advances and other receivables

Advances are recognized at cost, which is the fair value of the consideration given. However, an assessment is made at each reporting date to determine whether there is an indication that an advance may be impaired. If such an indication exists, the estimated recoverable amount of that asset is determined and an impairment loss is recognized for the difference between the recoverable amount and the carrying value.

Further, as disclosed in Note 4.12 to the financial statements, loan to related party and other receivables are recognized at amortized cost and being receivable from government owned entities, no ECL is recognized on them.

4.7 Government grants

Grants are recognized where there is reasonable assurance that the grant will be received and all attached conditions will be complied with. When the grant relates to an expense item, it is recognized as income over the period necessary to match the grant on a systematic basis to the costs that it is intended to compensate. When the grant relates to an asset, it is recognized as deferred grant and released to income in equal amounts over the expected useful life of the related asset.

4.10 Staff retirement benefit and other long-term benefits

The main features of the schemes operated by the Company for its employees are as follows:

a) Defined benefit plans

The Company operates unfunded pension, post retirement free electricity and medical benefits schemes for all its permanent employees. Provisions are made, annually, to cover obligations under these schemes, by way of a charge to statement of profit or loss, calculated in accordance with the actuarial valuation. The most recent valuation in this regard was carried out as at 30 June 2020, using the Projected Unit Credit Method. All re-measurement gains and losses are recognized in 'Other Comprehensive Income net of deferred tax' as they occur.

b) Accumulating compensated absences

The employees of the Company are entitled to accumulating compensated absences, which are encashable at the time of retirement up to a maximum limit of 365 days. Actuarial gains and losses on long-term compensated absences are recognized in statement of profit or loss.

c) Other benefits

For General Provident Fund and WAPDA Welfare Fund, the Company makes deduction from salaries of the employees and remits these amounts to the funds established by WAPDA.

As the General Provident Fund and WAPDA welfare fund are maintained by WAPDA on behalf of the Company, therefore relevant disclosures required under Section 218 and Fifth Schedule of the Companies Act 2017 are not applicable on the Company.

Judgement and estimates

The Company has made certain actuarial assumption as disclosed in Note 19.4 to the financial statements for valuation of present value of defined benefit plans and accumulating compensated absences.

4.11 Revenue from contract with customer

The Company is engaged in the business of generation of electricity. The Company signed its Power Purchase Agreement (PPA) with Central Power Purchasing Agency (Guarantee) Limited (CPPA-G), the sole customer of Company. In accordance with the PPA, the Company has assessed the following performance obligations:

- Making capacity available; and
- Delivering Net Electrical Output (NEO).

The Company has generally concluded that it is the principal in all of its revenue arrangements.

Judgment and estimates

The Company uses significant judgement and estimates in recognition of revenue from customer as follows:

a) Estimating transaction price

Energy and capacity charges are recognized at the tariff approved by the National Electric Power Regulatory Authority (NEPRA) under the mechanism laid down in the PPA. The Company has applied the practical expedient of recognizing revenue in the amount to which the Company has a right to invoice, being a right to consideration from CPPA-G in an amount that corresponds directly with the value to the CPPA-G, of the entity's performance completed to date.

The amount of revenue recognized in respect of sale of electricity includes the estimates of variable consideration when it is highly probable that a significant reversal in the amount of cumulative revenue recognized will not occur in future or when the uncertainty associated with the variable consideration is subsequently resolved. There is no significant financing component attached to the receivables from the customer.

b) Determination of timing of satisfaction of performance obligation

Revenue for:

- Sale of electricity to the CPPA-G (energy charges) is recognized when the Company satisfies performance obligation by delivering NEO to CPPA-G; and
- Capacity of the plant (capacity charges) is recognized when due, using the 'performance obligation satisfied over time' approach under IFRS 15 as the customer simultaneously receives and consumes the benefits provided by the Company's performance.

The energy and capacity charges are billed on monthly basis in arrears and in advance accordingly, in accordance with terms of PPA and have a credit period of 30 days.

4.12 Financial assets**a) Initial recognition and measurement**

Financial assets are classified, at initial recognition, as subsequently measured at amortized cost, fair value through other comprehensive income (OCI), and fair value through profit or loss.

The classification of financial assets at initial recognition depends on the financial asset's contractual cash flow characteristics and the Company's business model for managing them. With the exception of trade receivables that do not contain a significant financing component or for which the Company has applied the practical expedient, the Company initially measures a financial asset at its fair value plus, in the case of a financial asset not at fair value through profit or loss, transaction costs.

Trade receivables that do not contain a significant financing component or for which the Company has applied the practical expedient are measured at the transaction price as disclosed in Note 4.11 to the financial statements.

In order for a financial asset to be classified and measured at amortized cost or fair value through OCI, it needs to give rise to cash flows that are 'solely payments of principal and interest (SPPI)' on the principal amount outstanding. This assessment is referred to as the SPPI test and is performed at an instrument level. Financial assets with cash flows that are not SPPI are classified and measured at fair value through profit or loss, irrespective of the business model.

The Company's financial assets which includes bank balances, trade debt, long term deposits, loan to related party and other receivables, are recorded at amortized cost.

b) Subsequent measurement

The Company subsequently measures financial assets at amortized cost using the effective interest rate (EIR) method and are subject to impairment. Gains and losses are recognized in profit or loss when the asset is derecognized, modified or impaired.

c) Derecognition

A financial asset (or, where applicable, a part of a financial asset or part of a group of similar financial assets) is primarily derecognized (i.e., removed from the statement of financial position) when:

- The rights to receive cash flows from the asset have expired; or

- The Company has transferred its rights to receive cash flows from the asset or has assumed an obligation to pay the received cash flows in full without material delay to a third party under a 'pass-through' arrangement; and either (a) the Company has transferred substantially all the risks and rewards of the asset, or (b) the Company has neither transferred nor retained substantially all the risks and rewards of the asset, but has transferred control of the asset.

When the Company has transferred its rights to receive cash flows from an asset or has entered into a pass-through arrangement, it evaluates if, and to what extent, it has retained the risks and rewards of ownership. When it has neither transferred nor retained substantially all of the risks and rewards of the asset, nor transferred control of the asset, the Company continues to recognize the transferred asset to the extent of its continuing involvement. In that case, the Company also recognizes an associated liability. The transferred asset and the associated liability are measured on a basis that reflects the rights and obligations that the Company has retained.

Continuing involvement that takes the form of a guarantee over the transferred asset is measured at the lower of the original carrying amount of the asset and the maximum amount of consideration that the Company could be required to repay.

d) **Impairment**

The Company recognizes an allowance for expected credit losses (ECLs) for all debt instruments not held at fair value through profit or loss. ECLs are based on the difference between the contractual cash flows due in accordance with the contract and all the cash flows that the Company expects to receive, discounted at an approximation of the original effective interest rate. The expected cash flows will include cash flows from the sale of collateral held or other credit enhancements that are integral to the contractual terms.

ECLs are recognized in two stages. For credit exposures for which there has not been a significant increase in credit risk since initial recognition, ECLs are provided for credit losses that result from default events that are possible within the next 12-months (a 12-month ECL). For those credit exposures for which there has been a significant increase in credit risk since initial recognition, a loss allowance is required for credit losses expected over the remaining life of the exposure, irrespective of the timing of the default (a lifetime ECL).

SECP, through its S.R.O no. 985(I)/2019, dated 02 September 2019, has exempted the requirements contained in IFRS-9 (Financial Instruments) related to application of Expected Credit Losses method till 30 June 2021, in respect of financial assets due or ultimately due from the Government of Pakistan (GOP). The major financial assets of the Company include trade debt, loan and long term deposits from GOP or GOP owned entities. Accordingly, the Company has not recorded ECL against these financial assets. The impairment under IFRS 9 on financial assets other than these assets is insignificant and accordingly has not been incorporated in the financial statements.

4.13 Financial liabilities

a) **Initial recognition and measurement**

Financial liabilities are classified, at initial recognition, as financial liabilities at fair value through profit or loss, loans and borrowings, payables as appropriate.

All financial liabilities are recognized initially at fair value and, in the case of loans and borrowings and payables, net of directly attributable transaction costs.

The Company's financial liabilities include trade and other payables, long-term financing and interest accrued on long-term financing.

b) **Subsequent measurement**

After initial recognition, interest-bearing loans and borrowings are subsequently measured at amortized cost using the EIR method. Gains and losses are recognized in profit or loss when the liabilities are derecognized as well as through the EIR amortization process.

Amortized cost is calculated by taking into account any discount or premium on acquisition and fees or costs that are an integral part of the EIR. The EIR amortization is included as finance costs in the statement of profit or loss.

Further, the Company does not have any financial liability classified at fair value through profit and loss.

c) Derecognition

A financial liability is derecognized when the obligation under the liability is discharged or cancelled or expires. When an existing financial liability is replaced by another from the same lender on substantially different terms, or the terms of an existing liability are substantially modified, such an exchange or modification is treated as the derecognition of the original liability and the recognition of a new liability. The difference in the respective carrying amounts is recognized in the statement of profit or loss.

4.14 Offsetting of financial instruments

Financial assets and financial liabilities are offset, and the net amount is reported in the statement of financial position if there is a currently enforceable legal right to offset the recognized amounts and there is an intention to settle on a net basis, to realize the assets and settle the liabilities simultaneously.

4.15 Taxation

a) Income tax

The income tax expense or credit for the period is the tax payable on the current period's taxable income based on the applicable income tax rate for each jurisdiction adjusted by changes in deferred tax assets and liabilities attributable to temporary differences and to unused tax losses. The charge for income tax also includes adjustments, where considered necessary, to provision for tax made in previous years arising from assessments framed during the year for such years.

i) Current tax

Current income tax assets and liabilities are measured at the amount expected to be recovered from or paid to the taxation authorities. The tax rates and tax laws used to compute the amount are those that are enacted or substantively enacted at the reporting date. The Company takes benefit of any tax credit and rebate.

Under Power Purchase Agreement (PPA), dated 20 September 2015, with Central Power Purchasing Agency (Guarantee) Limited (CPPA-G), the Company can pass on the impact of any income tax paid to CPPA-G. In 2017, the Company filed a petition with NEPRA on 21 June 2017, for revision of tariff to incorporate the effect of the income tax paid by the Company. The management of the Company intends to recognize the resultant revenue, upon notification of new tariff, as a matter of prudence.

ii) Deferred tax

Deferred tax is provided in full, using the liability method, on temporary differences arising between the tax bases of assets and liabilities and their carrying amounts in the financial statements. Deferred income tax is determined using tax rates (and laws) that have been enacted or substantively enacted by the end of the reporting period and are expected to apply when the related deferred income tax asset is realized, or the deferred income tax liability is settled.

Deferred tax assets are recognized for deductible temporary differences and unused tax losses and credits only if it is probable that future taxable amounts will be available to utilize those temporary differences and unused tax losses and credits.

Current and deferred tax is recognized in profit or loss, except to the extent that it relates to items recognized in other comprehensive income or directly in equity. In this case, the tax is also recognized in other comprehensive income or directly in equity, respectively.

Judgment and estimates

Significant judgment is required in determining the income tax expenses and corresponding provision for tax. There are many transactions and calculations for which the ultimate tax determination is uncertain as these matters are being contested at various legal forums. The Company recognizes liabilities for anticipated tax issues based on estimates of whether additional taxes will be due. Where the final tax outcome of these matters is different from the amounts that were initially recorded, such differences will impact the current and deferred tax assets and liabilities in the period in which such determination is made.

Further, the carrying amount of deferred tax assets is reviewed at each reporting date and is adjusted to reflect the current assessment of future taxable profits. If required, carrying amount of deferred tax asset is reduced to the extent that it is no longer probable that sufficient taxable profits to allow the benefit of part or all of that recognized deferred tax asset to be utilized. Any such reduction shall be reversed to the extent that it becomes probable that sufficient taxable profit will be available.

Off-setting

Deferred tax assets and liabilities are offset when there is a legally enforceable right to offset current tax assets and liabilities and when the deferred tax balances relate to the same taxation authority. Current tax assets and tax liabilities are offset where the entity has a legally enforceable right to offset and intends either to settle on a net basis, or to realize the asset and settle the liability simultaneously.

b) Sales tax

Expenses and assets are recognized net of the amount of sales tax, except:

- When the sales tax incurred on a purchase of assets or services is not recoverable from the taxation authority, in which case, the sales tax is recognized as part of the cost of acquisition of the asset or as part of the expense item, as applicable; and
- When receivables and payables are stated with the amount of sales tax included.

The net amount of sales tax recoverable from, or payable to, the taxation authority is included as part of receivables or payables in the statement of financial position

4.16 Trade and other payables

Liabilities for creditors and other amounts payable are carried at cost which is the fair value of the consideration to be paid in the future for the goods and / or services received, whether or not billed to the Company.

4.17 Provisions

Provisions are recognized in the statement of financial position when the Company has legal or constructive obligation as a result of past events, and it is probable that outflow of economic benefits will be required to settle the obligation and a reliable estimate of the amount can be made.

Judgement and estimates

As the actual outflows can differ from estimates made for provisions, the carrying amounts of provisions are reviewed at each reporting date and adjusted to take account of such changes. Any adjustments to the amount of previously recognized provision is recognized in the statement of profit or loss unless the provision was originally recognized as part of cost of an asset.

4.18 Borrowing costs

Borrowing costs directly attributable to the acquisition, construction or production of an asset that necessarily takes a substantial period of time to get ready for its intended use or sale are capitalized as part of the cost of the asset. All other borrowing costs are expensed in the period in which they occur. Borrowing costs consist of interest and other costs that an entity incurs in connection with the borrowing of funds.

4.19 Foreign currency transactions and translation

Transactions in foreign currencies are initially recorded by the Company in Rupees using the exchange rates prevailing at the date the transaction first qualifies for recognition.

Monetary assets and liabilities denominated in foreign currencies are translated into Rupees using spot rates of exchange at the reporting date. Differences arising on settlement or translation of monetary items are capitalized as described in Note 2 to the financial statements.

Non-monetary items that are measured in terms of historical cost in a foreign currency are translated using the exchange rates at the dates of the initial transactions

In determining the spot exchange rate to use on initial recognition of the related asset, expense or income (or part of it) on the derecognition of a non-monetary asset or non-monetary liability relating to advance consideration, the date of the transaction is the date on which the Company initially recognizes the non-monetary asset or non-monetary liability arising from the advance consideration. If there are multiple payments or receipts in advance, the Company determines the transaction date for each payment or receipt of advance consideration.

4.19 Standards, interpretations and amendments to published approved accounting standards that are not yet effective

The following amendments and interpretations with respect to the approved accounting standards as applicable in Pakistan, would be effective from the date mentioned below against the respective standard or interpretation and have not been adopted early by the Company:

Standard or Interpretation	Effective date (annual periods beginning on or after)
IFRS 17 - Insurance Contracts and related amendments	01 January 2023
IFRS 3 - Definition of a Business (Amendments)	01 January 2020
IAS 1 & IAS 8 - Definition of Material	01 January 2020
IAS 1 & IAS 8 - Presentation of Financial Statements Classification of liabilities	01 January 2023
IAS 16 - Property, Plant and Equipment — Proceeds before Intended Use (amendments)	01 January 2022
IAS 37 - Onerous Contracts — Cost of Fulfilling a Contract	01 January 2022
Covid-19-Related Rent Concessions (Amendment to IFRS 16)	01 June 2020
IFRS 10 - Consolidated Financial Statements and IAS 28 Investment in Associates and Joint Ventures - Sale or Contribution of Assets between an Investor and its Associate or Joint Venture (Amendment)	Not yet finalized
Annual Improvements to IFRS Standards 2018–2020	01 January 2022
IFRS - 4 Extension of the Temporary Exemption from Applying IFRS 9	01 January 2023
IFRS 7 & 9 - Financial Instruments - Amendments regarding pre-replacement issues in the context of the interest rate benchmark reform (IBOR)	01 January 2020
Amendments to IFRS 3 - Business Combinations - Update a reference in IFRS 3 to the Conceptual Framework for Financial Reporting without changing the accounting requirements for business combinations.	01 January 2022

The above amendments are not expected to have any material impact on the Company's financial statements in the period of initial application.

The International Accounting Standards Board (IASB) has also issued the revised Conceptual Framework for Financial Reporting (the Conceptual Framework) in March 2018 which is effective for annual periods beginning on or after 1 January 2020 for preparers of financial statements who develop accounting policies based on the Conceptual Framework. The revised Conceptual Framework is not a standard, and none of the concepts override those in any standard or any requirements in a standard. The purpose of the Conceptual Framework is to assist IASB in developing standards, to help preparers develop consistent accounting policies if there is no applicable standard in place and to assist all parties to understand and interpret the standards.

Further, the following new standards have been issued by IASB which are yet to be notified by the Securities and Exchange Commission of Pakistan (SECP) for the purpose of applicability in Pakistan:

Standard	IASB effective date (Annual periods beginning on or after)
IFRS 1 - First-time Adoption of International Financial Reporting Standards	01 July 2009
IFRS 17 - Insurance Contracts	01 January 2021

The Company expects that adoption of above standards will not have any material impact on the Company's financial statements in the period of initial application.

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5. PROPERTY, PLANT AND EQUIPMENT

Operating fixed assets - owned
Capital work-in-progress

Note	2020 —Rupees in thousands—	2019 —Rupees in thousands—
5.1	101,891,264	105,871,790
5.2	10,310	-
	<u>101,901,574</u>	<u>105,871,790</u>

5.1 Operating fixed assets - owned

	2020							WRITTEN	Depreciation rate
	COST			ACCUMULATED DEPRECIATION				DOWN VALUE	
	As at 01 July 2019	Additions	Transfers	As at 30 June 2020	As at 01 July 2019	Charge for the year	Transfers	As at 30 June 2020	
	-----Rupees in thousands-----			-----Rupees in thousands-----					%
Land - freehold	14,513	-	-	14,513	-	-	-	14,513	-
Civil work / building on freehold land	7,701,030	455,117	-	8,156,147	1,843,358	141,190	-	6,171,599	2
Power generation plant and equipment	120,946,329	1,269,115	228,837	122,444,281	28,260,910	4,924,405	130,992	89,127,974	4 - 45
General plant assets - ancillary equipment	2,963,222	3,736	-	2,966,958	721,736	174,264	-	2,070,958	4 - 25
Gas pipelines	1,595,440	-	-	1,595,440	243,668	48,567	-	1,303,205	3.3 - 10
Capital stores and spares	6,100,200	-	(228,837)	5,871,363	2,414,541	411,004	(130,992)	3,176,810	2 - 37
Furniture and fixtures	43,834	-	-	43,834	42,928	167	-	43,095	10
Vehicles	109,837	5,428	-	115,265	75,474	14,325	-	89,799	20
	<u>139,474,405</u>	<u>1,733,396</u>	<u>-</u>	<u>141,207,801</u>	<u>33,602,615</u>	<u>5,713,922</u>	<u>-</u>	<u>39,316,537</u>	<u>101,891,264</u>

	2019							WRITTEN	Depreciation rate
	COST			ACCUMULATED DEPRECIATION				DOWN VALUE	
	As at 01 July 2018	Additions / transfers from Capital work-in-progress*	Adjustment (Note 5.1.3)	As at 30 June 2019	As at 01 July 2018	Charge for the year	Adjustment (Note 5.1.3)	As at 30 June 2019	
	-----Rupees in thousands-----			-----Rupees in thousands-----					%
Land - freehold	14,513	-	-	14,513	-	-	-	14,513	-
Civil work / building on freehold land	7,668,329	32,701	-	7,701,030	1,705,304	138,054	-	5,857,672	2
Power generation plant and equipment	105,576,900	14,294,141	(505,672)	120,946,329	24,254,207	4,127,021	(120,318)	92,685,419	4 - 45
General plant assets - ancillary equipment	2,307,392	16,254	-	2,963,222	547,924	173,812	-	2,241,486	4 - 25
		639,576	-						
Gas pipelines	1,595,440	-	-	1,595,440	185,872	57,796	-	1,351,772	3.3 - 10
Capital stores and spares	6,049,060	51,140	-	6,100,200	1,919,601	494,940	-	3,685,659	2 - 37
Furniture and fixtures	43,834	-	-	43,834	42,761	167	-	42,928	10
Vehicles	109,769	68	-	109,837	59,441	16,033	-	34,363	20
	<u>123,365,237</u>	<u>16,614,840</u>	<u>(505,672)</u>	<u>139,474,405</u>	<u>28,715,110</u>	<u>5,007,823</u>	<u>(120,318)</u>	<u>33,602,615</u>	<u>105,871,790</u>

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- 5.1.1 As explained in Note 1.2, the property and rights on certain assets were transferred to the Company on 02 March 1999 by WAPDA, in accordance with the terms and conditions of the BTA, between WAPDA and the Company. However, titles of the freehold land and vehicles, in the land revenue records and with the registration authority, respectively have not been transferred in the name of the Company.
- 5.1.2 The cost of the assets as on 30 June 2020 includes fully depreciated assets amounting to Rs. 4,718,655 thousand (2019: Rs. 4,718,655 thousand) which are still in use of the Company.
- 5.1.3 This adjustment to power generation plant and equipment represents reversal of excess accrual capitalized in the year ended 30 June 2015 on estimate basis. Related depreciation charged in prior years, on the excess amount has also been reversed.
- 5.1.4 The additions to power generation plant and equipment include exchange loss in accordance with the exemption granted by SECP as stated in Note 2 to the financial statements. The movement in exchange loss capitalized is as follows:

	2020	2019
	---Rupees in thousands---	
Cost:		
Opening balance	20,546,792	6,395,657
Addition during the year	666,821	14,151,135
Closing balance	21,213,613	20,546,792
Less:		
Accumulated depreciation:		
Opening balance	322,158	63,711
Charge during the year	860,623	258,447
Closing balance	1,182,781	322,158
Written down value as at 30 June	20,030,832	20,224,634

- 5.1.5 On 14 December 2018, the GOP through Power Holding (Private) Limited (a company fully owned by the GOP and established to pay the power sector circular debt), has arranged Shariah Compliant Islamic Finance Facility through issuance of Sukuk-1 to Meezan Bank Limited amounting to Rs. 200,000 million, for the period of 10 years to settle the energy sector circular debts of all distribution companies (DISCOs). The facility is secured against the land owned by power sector entities comprising DISCOs/GENCOs. Accordingly, the GOP at the time of agreement hired independent valuer who has estimated the value of land. According to the said arrangement, the land of the Company worth Rs 1,428 million is also included in the security. The legal documents executed by the Company and the relevant counter parties reveal that the said assets have been leased out under Ijarah agreement to GOP with an undertaking to resell the assets to the Company at the end of Ijarah term. The proceeds of Sukuk Bonds have been retained by the PHPL and the said Sukuk and Ijarah rentals are to be repaid by the GOP. Further, according to the directives issued by the GOP vide letter No. PF-05(06)/12 dated 14 December 2018, the said transaction neither involves any physical transfer of the underlying assets nor creates any financial implication on the Company. Accordingly, the management has exercised its judgement and concluded that the conditions of transfer of control is not satisfied as per IFRS 15 and consequently, the said transaction is in substance, a financing arrangement. Accordingly, the Company is not required to derecognize the assets

		2020	2019
	Note	---Rupees in thousands---	
5.1.6 Depreciation charge for the year has been allocated as under:			
Cost of revenue	24	5,599,644	4,789,755
Administrative expenses	25	114,278	97,750
		5,713,922	4,887,505
5.2 Capital work-in-progress			
Opening balance		-	1,728,804
Additions during the year		10,310	491,732
Less : Transferred to property, plant and equipment		-	(2,220,536)
		10,310	-

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		2020	2019
	Note	---Rupees in thousands---	
6. LONG TERM ADVANCES - unsecured			
Advances to employees against:			
House building / purchase of plot		60,641	59,044
Vehicles		<u>2,644</u>	<u>3,005</u>
	6.1	<u>63,285</u>	<u>62,049</u>
Less: Current portion of long-term advances	10	<u>(11,830)</u>	<u>(12,890)</u>
		<u><u>51,655</u></u>	<u><u>49,159</u></u>

6.1 Advances for house building and purchase of land are recoverable over 10 years, whereas, advances for car / motorcycle are recoverable over 5 years. Interest is charged on these advances at the same interest rate as that payable on the employees' balances with the General Provident Fund, maintained by WAPDA.

		2020	2019
	Note	---Rupees in thousands---	
7. STORES, SPARE PARTS AND LOOSE TOOLS			
TPS Guddu		<u>3,728,987</u>	<u>2,426,635</u>
Less: Provision for slow moving / obsolete items		<u>(85,402)</u>	<u>(85,402)</u>
		<u>3,633,585</u>	<u>2,331,233</u>
TPS Quetta		<u>159,062</u>	<u>159,062</u>
Less: Provision for slow moving / obsolete items		<u>(159,062)</u>	<u>(159,062)</u>
		<u>24,607</u>	<u>24,607</u>
Less: Provision for slow moving / obsolete items		<u>(24,607)</u>	<u>(24,607)</u>
	7.1	<u><u>3,633,585</u></u>	<u><u>2,331,233</u></u>

7.1 Movement during the year is as follows:

Opening balance		2,610,304	2,363,817
Additions during the year	7.2	<u>2,040,254</u>	<u>686,425</u>
		<u>4,650,558</u>	<u>3,050,242</u>
Less:			
Issuance during the year		<u>(721,366)</u>	<u>(439,938)</u>
Written off during the year		<u>(16,536)</u>	<u>-</u>
		<u>(737,902)</u>	<u>(439,938)</u>
		<u>3,912,656</u>	<u>2,610,304</u>
Less: Provision for slow moving / obsolete items		<u>(279,071)</u>	<u>(279,071)</u>
		<u><u>3,633,585</u></u>	<u><u>2,331,233</u></u>

7.2 This mainly represent purchase of store, spare parts and loose tools for use in Central store, Block I, Block II and Block V, situated at TPS Guddu

		2020	2019
	Note	---Rupees in thousands---	
8. STOCK-IN-TRADE			
	8.1	<u>928,352</u>	<u>928,352</u>

8.1 This represents furnace oil and high speed diesel, initially procured to be used in the generation of electricity, testing of power plants and now held for emergency operations.

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	Note	2020 ---Rupees in thousands---	2019
8.2	Movement in stock-in-trade during the year is as follows:		
	Opening balance	928,352	870,461
	Net Realizable Value (NRV) adjustment	-	58,164
	Consumed during the year	-	(273)
	Balance at the end of the year	<u>928,352</u>	<u>928,352</u>

9. TRADE DEBT - unsecured

Receivable from CPPA-G	9.1	68,979,818	54,891,087
Less: Provision for doubtful debt	9.3	(706,626)	(706,626)
		<u>68,273,192</u>	<u>54,184,461</u>

9.1 Movement in receivable from CPPA-G during the year is as follows:

Opening recognized		54,891,087	17,951,359
Revenue during the year from TPS Guddu	23	76,204,531	88,607,453
		<u>131,095,618</u>	<u>106,558,812</u>
Less:			
Funds received during the year		(62,115,800)	(46,696,000)
Adjustment due to adoption of IFRS 15 as at 01 January 2019		-	(4,960,682)
Against management fee paid on behalf of the Company		-	(11,043)
		<u>(62,115,800)</u>	<u>(51,667,725)</u>
	9.2	<u>68,979,818</u>	<u>54,891,087</u>

9.2 This includes receivable against supply of electricity.

		2020 ---Rupees in thousands---	2019
On open cycle generation	9.2.1	12,651,277	10,267,062
From TPS Quetta	9.2.2	1,683,492	1,683,492
From rental power project Naudero-I	9.2.3	722,852	722,852
		<u>15,057,621</u>	<u>12,673,406</u>

9.2.1 This represents amount receivable from CPPA-G in respect of supply of electricity on open cycle generation of the Company. The Company had invoiced CPPA-G, against the electricity supplied from 747 MW plant using rates applied for open cycle generation, which has not been acknowledged by CPPA-G on the basis of NEPRA's determination dated 27 April 2018, which stated that no such rates were allowed to the Company. The Company also intends to file a review petition with NEPRA against the said determination. Further, the Company expects to recover this amount in full and hence, no provision has been recognized against this amount.

9.2.2 This represents claims of the Company against supply of electricity from TPS Quetta. The amount is disputed between CPPA-G due to non-availability of the tariff determination from NEPRA for the same. However, the management of the Company based on the opinion of legal advisor is confident about full recovery of the balance, hence, no provision has been recorded in these financial statements.

9.2.3 This represents invoices against supply of electricity from rental power project Naudero-I for the period from May 2010 to March 2012 amounting to Rs. 1,639,293 thousands in gross. The amount is not processed by CPPA-G on the grounds that honorable Supreme Court of Pakistan (SCP) had declared all the contracts with rental power projects void ab initio. However, the management of the Company is confident of full recovery of the balance as the related electricity was supplied upon the instructions of National Transmission and Dispatch Company Limited. However, being prudent, the management has only recorded receivable balance amounting to Rs 722,852 thousands which comprises only fuel cost and fixed cost component of the invoices excluding sales tax

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- 9.3 This represents the provision made against the long term receivable from CPPA-G.
- 9.4 Maximum amount outstanding at anytime during the year with reference to month end was Rs. 79,177,746 thousand (2019: Rs. 54,981,087 thousand).
- 9.5 The age analysis is provided in Note 31.2.

10. ADVANCES, LOAN AND PREPAYMENTS	Note	2020	2019
		----Rupees In thousands----	
Advances - unsecured	10.1	604,028	3,195,931
Loan to related party	10.2	424,770	238,617
Prepayments		1,104	-
		<u>1,029,902</u>	<u>3,434,548</u>
10.1 Advances - unsecured			
Advances to employees against:			
- Travelling		180	835
- Other expenses		1,057	896
		1,237	1,731
Advances to suppliers / contractors	10.1.1	632,914	3,181,310
Current portion of long term advances	6	11,630	12,890
		<u>645,781</u>	<u>3,195,931</u>
Less: Provision for doubtful advances	10.1.2	(41,753)	(41,753)
		<u>604,028</u>	<u>3,154,178</u>

10.1.1 This includes an advance of Rs. 491,022 thousand (2019: Rs. 566,296 thousand) paid to the Chief Resident Representative Karachi (CRRK) WAPDA, an associated entity, for the import of equipments, stores and spare parts.

Maximum amount outstanding with CRRK WAPDA at anytime during the year with reference to month end amounted to Rs. 639,296 thousand (2019: Rs. 1,099,744 thousand).

10.1.2 These represent advances extended to following parties against rental power projects:		2020	2019
		----Rupees In thousands----	
<u>Party Name</u>	<u>Project</u>		
Pakistan Power Resource-LLC	110 MW Guddu	1,404	1,404
Walters Power International	51 MW Naudero-I	40,349	40,349
		<u>41,753</u>	<u>41,753</u>

The Company has issued demand notices for recovery of these advances. The matter is under investigation by the National Accountability Bureau (NAB), as part of the larger investigation ordered by the honorable Supreme Court of Pakistan into rental power projects. The management of the Company is confident about the recovery of advances, however, as a matter of prudence, the Company has recognized a provision against the full amount.

10.2 This represents loan given to Lakhra Power Generation Company Limited (GENCO-IV), an associated company. The loan is interest free and has been given under the Instructions of GOP.

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11. OTHER RECEIVABLES	Note	2020	2019
		---Rupees in thousands---	
Due from:			
Associated undertakings	11.1	994,006	1,016,158
Walters Power International	11.2	194,056	194,056
		<u>1,188,062</u>	<u>1,210,214</u>
Accrued interest on bank deposits		9,404	5,460
Less:		<u>1,197,466</u>	<u>1,215,674</u>
Provision for doubtful receivable from Walter Power International	11.2	(194,056)	(194,056)
		<u>1,003,410</u>	<u>1,021,618</u>

11.1 Due from associated undertakings

WAPDA	11.1.1	135,327	131,777
Northern Power Generation Company Limited (NPGCL)		767,701	774,816
Chief Resident Representative Karachi (CRRK)		6,532	23,669
Jamshoro Power Generation Company Limited (GENCO-I)		84,446	85,764
Lakhra Power Generation Company Limited (GENCO-IV)		-	132
	11.1.2	<u>994,006</u>	<u>1,016,158</u>

11.1.1 The net amount includes a receivable from WAPDA as follows:

Workers' Welfare Fund	32,773	29,223
Others	102,554	102,554
	<u>135,327</u>	<u>131,777</u>

11.1.2 Maximum amounts outstanding at anytime during the year calculated with reference to month end balance as follows:

	2020	2019
	---Rupees in thousands---	
WAPDA	39,638	133,229
Northern Power Generation Company Limited (GENCO-III)	771,239	760,998
Jamshoro Power Generation Company Limited (GENCO-I)	85,861	85,669
Lakhra Power Generation Company Limited (GENCO-IV)	-	151

The receivable is unsecured and is neither past due nor impaired.

11.2 This amount is receivable from Walters Power International against the cost of gas used during the trial run period, paid by the Company, in the year ended 30 June 2010 and 2011. The amount is doubtful due to ongoing investigation of NAB as disclosed above in Note 10.1.2. Therefore, being prudent, the Company has recognized a provision against the full amount.

12. TAX REFUNDS DUE FROM THE GOVERNMENT	Note	2020	2019
		---Rupees in thousands---	
Sales tax	12.1	4,274,507	3,581,177
Less : Provision for doubtful refunds		(492,807)	(492,807)
Sales tax - net		<u>3,781,700</u>	<u>3,088,370</u>
Income tax		480,823	914,454
		<u>4,262,523</u>	<u>4,002,824</u>

12.1 This includes an amount of Rs. 100,000 thousand deposited by the Company in 2017 under the protest, in the government treasury, in response to a verbal demand of the taxation authorities. The management is confident of full recovery.

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		2020	2019
		---Rupees in thousands---	
13. BANK BALANCES	Note		
Deposit accounts - local currency	13.1	<u>10,166,613</u>	<u>6,105,556</u>

13.1 These carry interest ranging from 7.5% to 12.7% (2019: 4.5% to 11.65%) per annum.

		2020	2019
		---Rupees in thousands---	
14. ISSUED, SUBSCRIBED AND PAID-UP SHARE CAPITAL	Note		
50,000 (2019: 50,000) ordinary shares of Rs. 10 each, fully paid in cash	14.1	<u>500</u>	<u>500</u>

14.1 All the shares are held by the Government of Pakistan (GOP).

		2020	2019
		---Rupees in thousands---	
15. DEPOSIT FOR SHARES	Note		
Incorporation expenses incurred by WAPDA		5,020	5,020
Allocation of debt services liability	15.1	3,070,460	3,070,460
Conversion of long term loan	15.2	<u>268,439</u>	<u>268,439</u>
		<u>3,343,919</u>	<u>3,343,919</u>

15.1 This represents the debt services provided by WAPDA on foreign relent and cash development loans, against which the Company will issue shares to WAPDA, upon WAPDA's instructions.

15.2 This represents the conversion of long-term loans obtained by WAPDA, and payable to the GOP, into equity of the GOP in WAPDA. WAPDA has passed this effect to the Company. The Company will issue shares to WAPDA, upon WAPDA's instructions.

		2020	2019
		---Rupees in thousands---	
16. LONG TERM FINANCING	Note		
From financial institutions, secured			
Foreign direct loans	16.1	39,135,390	46,627,483
From related party, unsecured			
Foreign relent loans	16.2	133,854	133,854
Cash development loans			
- For 747MW	16.3	<u>7,873,396</u>	<u>7,873,396</u>
- For general purpose	16.4	<u>171,142</u>	<u>171,142</u>
		<u>8,044,538</u>	<u>8,044,538</u>
		<u>47,313,782</u>	<u>54,805,875</u>
Less : Current portion shown under current liabilities			
Foreign direct loans		<u>8,696,753</u>	<u>8,477,724</u>
Foreign relent loans		<u>133,854</u>	<u>133,854</u>
Cash development loans:			
- For 747MW		<u>713,848</u>	<u>546,153</u>
- For general purpose		<u>102,369</u>	<u>79,835</u>
		<u>9,646,824</u>	<u>9,237,566</u>
		<u>37,666,958</u>	<u>45,568,309</u>

16.1 This represents an export credit facility obtained from a consortium of banks for a period of 6 years, with Hong Kong Shanghai Banking Corporation and The Export-Import Bank of China as the mandated lead arrangers, having a sanctioned limit of \$ 464,084,737. The last tranche was drawn during 2016. Actual drawdown amounted to \$ 463,828,843 equivalent to Rs. 48,701,818 thousand at spot exchange rate. The loan was obtained to finance the 747 MW power generation plant, and is repayable in eighteen equal semi-annual installments commencing from 21 January 2016. The loan carries mark-up at the rate of LIBOR plus 2.4% with the effective interest rate of 4.24% as of 30 June 2020 (2019: LIBOR plus 2.4% with the effective interest rate of 5.22%). The loan is secured by way of a guarantee issued by the President of the Islamic Republic of Pakistan, through the Ministry of Finance and Revenue (MoFR).

- 16.2 These represent various re-lent loans granted to the Company from MoFR through WAPDA, for the purpose of meeting cash requirements of the Company. These loans were payable in 12 to 13 equal annual installments, commencing from 30 June 2004. The interest rate on these loans is 11% (2019: 11%) per annum. The Company has not made any payment to settle the principal, and related interest accrued, since the year ended 30 June 2015. However, the Company intends to settle the outstanding balance in due time, after receipt of specific instructions from MoFR.
- 16.3 These represent three loans obtained by the Company from MoFR for financing 747 MW power generation plant. The loans are repayable in 20 annual installments, commencing from 30 June 2011. The interest rate on these loans ranges from 12.64% to 13.61% (2019: 12.64% to 13.61%) per annum. The interest payment commenced from 30 June 2016. The Company has not made any payment to settle the principal, and related interest accrued, since the year ended 30 June 2015. However, the Company intends to settle the outstanding balance in due time, after receipt of specific instructions from MoFR.
- 16.4 These represent two loans obtained by the Company from MoFR through WAPDA for the purpose of meeting general cash requirements of the Company. These loans are repayable in 20 equal annual installments, commencing from 30 June 2004. The interest rate on these loans ranges from 17.71% to 18.03% (2019: 17.71% to 18.03%) per annum. The Company has not made any payment to settle the installments, and related interest accrued, since the year ended 30 June 2015. However, the Company intends to settle the outstanding balance in due time, after receipt of specific instructions from MoFR.
- 16.5 As at 30 June 2020, total loan installments and interest accrued amounting to Rs. 759,843 (2019: Rs. 592,495) thousand and Rs. 5,195,460 (2019: Rs. 4,191,662) thousand, respectively, are overdue. The remaining outstanding balances and the related interest accrued will also be settled upon specific instructions from MoFR. All of the overdue balances have been shown under current liabilities and no interest is charged on the outstanding balance, after their due dates.

	2020	2019
	---Rupees in thousands---	
16.6 The movement in long term financing is as follows:		
Opening balance	54,805,875	48,912,696
Repayments during the year	(8,154,592)	(6,908,184)
Exchange loss for the year - net	662,499	12,801,363
	<u>47,313,782</u>	<u>54,805,875</u>
17. DEFERRED TAXATION - NET		
Deferred tax liability resulting from:		
Accelerated depreciation on property, plant and equipment	16,813,410	16,184,541
Deferred tax asset resulting from:		
Unabsorbed depreciation	(5,218,661)	(6,359,203)
Staff retirement benefits	(8,961,315)	(7,954,156)
Provision for doubtful debts	(204,922)	(204,922)
Tax credit under section 65B	-	(553,196)
Provision for disputed gas payables	(118,748)	(118,748)
	<u>(14,503,646)</u>	<u>(15,190,225)</u>
	<u>2,309,764</u>	<u>994,316</u>
18. DEFERRED GRANT		
Opening balance	387,181	595,771
Less: Amortized during the year	26 (198,590)	(198,590)
	<u>198,591</u>	<u>397,181</u>
18.1 This represents the grant received from United States Agency for International Development (USAID) for major overhauling of the 600 MW plant of the Company.		
19. STAFF RETIREMENT BENEFITS		

Four types of staff benefits are offered by the Company itself, namely pension obligations, medical benefits, free electricity and accumulated compensated absences.

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	Defined benefit scheme						Other long-term benefit		Total	
	Pension obligations - unfunded		Medical benefits		Free electricity		Accumulated compensated absences			
	2020	2019	2020	2019	2020	2019	2020	2019	2020	2019
Rupees in thousands										
19.1	The amounts recognized in the statement of financial position									
	Present value of defined benefit obligations									
	24,604,429	21,720,692	3,467,102	2,625,777	2,086,692	2,255,177	742,862	826,478	30,901,085	27,428,124
19.2	Changes in the present value of defined benefit obligations:									
	Opening balance									
	21,720,692	19,370,212	2,625,777	2,475,945	2,255,177	1,079,291	826,478	795,919	27,428,124	23,721,367
	Current service cost									
	188,027	191,530	57,456	50,856	85,642	87,145	493	3,652	331,618	333,183
	Interest cost									
	3,080,161	1,899,547	373,720	244,364	326,949	107,893	111,867	76,073	3,892,697	2,327,877
	Benefits paid during the year									
	(956,407)	(749,476)	(96,796)	(64,619)	(716)	(725)	(82,898)	(70,388)	(1,136,817)	(885,208)
	Actuarial loss / (gain) on obligation									
	571,956	1,008,879	506,945	(80,769)	(580,360)	981,573	(113,078)	21,222	385,463	1,930,905
	Balance at the end of the year									
	24,604,429	21,720,692	3,467,102	2,625,777	2,086,692	2,255,177	742,862	826,478	30,901,085	27,428,124
19.3	Charge for the year to:									
	Profit or loss									
	Current service cost									
	188,027	191,530	57,456	50,856	85,642	87,145	493	3,652	331,618	333,183
	Interest cost									
	3,080,161	1,899,547	373,720	244,364	326,949	107,893	111,867	76,073	3,892,697	2,327,877
	Actuarial (gain) / loss recognized									
	3,268,188	2,091,077	431,176	295,220	412,591	195,038	(718)	100,947	4,111,237	2,682,282
	Other comprehensive income									
	Actuarial loss / (gain)									
	571,956	1,008,879	506,945	(80,769)	(580,360)	981,573	-	-	496,541	1,909,683
19.3.1	Charge to profit or loss has been allocated as follows:									
	Cost of revenue									
	3,039,415	1,944,702	400,994	274,555	383,710	181,385	(668)	93,881	3,823,451	2,494,523
	Administrative expenses									
	228,773	146,375	30,182	20,665	28,881	13,653	(50)	7,066	287,786	187,759
	3,268,188	2,091,077	431,176	295,220	412,591	195,038	(718)	100,947	4,111,237	2,682,282

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19.4 Significant actuarial assumptions at the reporting date are:	Defined benefit scheme						Other long-term benefit	
	Pension obligations - unfunded		Medical benefits		Free electricity		Accumulated compensated absences	
	2020	2019	2020	2019	2020	2019	2020	2019
Discount rate	10.00%	14.50%	10.00%	14.50%	10.00%	14.50%	10.00%	14.25%
Future salary increase	10.00%	14.50%	10.00%	14.50%	-	-	10.00%	14.25%
Long-term salary increase rate	10.00%	14.50%	10.00%	14.50%	-	-	10.00%	14.25%
Indexation rate	8.00%	8.25%	-	-	-	-	-	-
Medical indexation rate - medical allowance	-	-	2.50%	2.50%	-	-	-	-
Medical indexation rate - medical facility	-	-	10.00%	10.00%	-	-	-	-
Annual medical claim - medical facility	-	-	Rs.63,864p.a.	Rs.50,307p.a.	-	-	-	-
Electricity indexation rate (p.a.)	-	-	-	-	8.00%	12.50%	-	-

19.5 Historical information:	Experience adjustments on obligations				Present value of defined benefit obligations			
	Pension obligations	Medical benefits	Free electricity	Compensated absences	Pension obligations	Medical benefits	Free electricity	Compensated absences
	Rupees in thousands				Rupees in thousands			
2020	571,956	506,945	(580,360)	(113,078)	24,604,429	3,467,102	2,086,692	742,862
2019	1,008,879	(80,769)	981,573	21,222	21,720,692	2,625,777	2,255,173	826,478
2018	731,079	(105,293)	(1,397,001)	26,293	19,370,212	2,475,945	1,079,291	795,919
2017	440,887	406,356	(1,293,223)	64,214	16,556,695	2,266,604	2,183,122	717,986
2016	1,601,587	(470,753)	957,121	-	14,931,811	1,677,886	3,175,018	643,778
2015	2,377,583	456,501	(66,241)	-	12,500,241	1,897,371	1,950,483	972,990

19.6 Risks associated with the above benefits:

The defined benefit plans expose the Company to the following risks:

Final salary risk - The risk that the final salary at the time of cessation of service is greater than what was assumed.

Longevity risks - The risk arises when the actual lifetime of retirees is longer than expectation. This risk is measured at the plan level over the entire retiree population.

Withdrawal risk - The risk of higher or lower withdrawal experience than assumed. The final effect could go either way depending on the beneficiaries' service/age distribution and the benefit.

19.7 Sensitivity analysis

The calculations of the defined benefit obligation and other long-term benefit are sensitive to the significant actuarial assumptions, as disclosed in Note 19.4. The table below summarizes how the defined benefit obligation and long-term benefit at the end of the reporting period would have increased / decreased, as a result of change in respective significant assumptions.

	Impact on defined benefit	
	1% increase in assumption	1% decrease in assumption
	---Rupees in thousands---	
Discount rate		
Pension obligation - unfunded	21,676,134	28,802,986
Medical benefits	2,879,489	4,189,861
Free electricity	1,761,890	2,479,553
Accumulated compensated absences	684,001	800,750
Salary Increase rate		
Pension obligation - unfunded	25,096,595	23,933,766
Medical benefits	807,156	677,553
Pension Indexation rate		
Pension obligation - unfunded	28,307,077	21,974,660
Medical Inflation rate		
Medical benefits	4,228,809	2,884,060
Electricity indexation rate		
Free electricity	2,515,349	1,732,093

19.8 As at reporting date, the weighted average life of the defined benefit and long term benefit scheme was 14 years (2019: 11.75 years).

19.9 Expected defined benefit cost to be recognized for the year ended 30 June 2021, would be as follows:

	Rupees in thousands
Pension obligations - unfunded	2,667,273
Medical benefits	409,912
Free electricity	302,876
Accumulated compensated absences	74,829
	<u>3,454,890</u>

20. TRADE AND OTHER PAYABLES

	Note	2020 ---Rupees in thousands---	2019
Trade creditors	20.1	91,184,218	75,240,724
Payable for capital expenditure		420,127	398,277
Payable to General Electrics		4,816,681	7,381,938
Due to associated undertakings	20.2	7,161,404	6,252,106
Amounts withheld from gas suppliers		409,477	409,477
Accrued liabilities		409,199	196,332
Retention money payable		4,278	7,883
Withholding tax payable		11,073	3,379
Other liabilities		44,183	65,367
		<u>104,460,640</u>	<u>89,955,483</u>

20.1 This includes Gas Infrastructure Development Cess (GIDC) payable to gas suppliers is amounting to Rs. 10,473,482 thousand. The GIDC payable by the Company forms part of the tariff approved by NEPRA. The movement is as follows:

	2020 ---Rupees in thousands---	2019
Opening balance	11,096,016	7,411,870
Accrued during the year	6,130,456	9,945,343
Payment during the year	(6,752,990)	(6,261,197)
	<u>10,473,482</u>	<u>11,096,016</u>

20.2 Due to associated undertakings

This represents the net amounts payable to various related parties on account of free electricity provided to the families of the Company's employees, residing within the territorial jurisdiction of these related parties, and payments of other expenses incurred on behalf of the Company. A party wise breakup is as follows:

	2020	2019
	---Rupees in thousands---	
Faisalabad Electric Supply Company Limited	7,745	5,522
Gujranwala Electric Power Company Limited	3,533	2,669
Hyderabad Electric Supply Company Limited	1,503,890	1,499,556
Quetta Electric Supply Company Limited	4,344	3,297
Islamabad Electric Supply Company Limited	6,018	5,371
Lahore Electric Supply Company Limited	7,526	4,619
Multan Electric Power Company Limited	68,468	53,652
Peshawar Electric Supply Company Limited	3,431	3,144
Sukkur Electric Power Company Limited	5,184,040	4,323,300
WAPDA	48,015	48,795
National Transmission Dispatch Company Limited	299,180	302,181
Lakhra Power Generation Company Limited (GENCO-IV)	5,167	-
GENCO Holding Company Limited	20,057	-
	<u>7,161,404</u>	<u>6,252,106</u>

21. INTEREST ACCRUED ON LONG TERM FINANCING

Foreign direct loan	747,563	1,088,364
Guarantee fee on foreign direct loan	1,542,491	1,342,678
Foreign relent loan	15,668	15,668
Cash development loans:		
For 747MW	5,045,736	4,061,726
For general purpose	134,057	114,270
	<u>5,179,793</u>	<u>4,175,995</u>
	<u>7,485,515</u>	<u>6,622,705</u>

22. CONTINGENCIES AND COMMITMENTS

22.1 Contingencies:

22.1.1 A large number of small cases have been filed against the Company, primarily by the Company's employees and vendors, the quantum of which cannot be estimated reliably. However, the management is of the view that in the overall context of these financial statements, there would be no significant liability on the part of the Company, in respect of such cases

22.1.2 The Company has not accounted for interest on overdue payments of its gas suppliers i.e. Pakistan Petroleum Limited (PPL) and Mari Petroleum Company Limited (MPCL), amounting to Rs. 17,145,233 (2019: Rs. 12,881,291) thousand and Rs. 4,944,575 (2019: Rs. 2,579,962) thousand respectively, as calculated by the Company against Rs. 22,011,848 (2019: Rs. 15,067,642) thousand demanded by PPL and Rs. 13,715,439 (2019: Rs. 10,029,000) thousand demanded by MPCL. The Company has signed Gas Supply Agreement and Gas Sales Term Sheet with PPL, on 23 October 2017, and MPCL, on 20 June 2017, effective from 08 May 2013 and 09 February 2016 respectively. These arrangements replaced the previous Gas Supply Agreements (Old GSAs) signed between WAPDA and these counterparties, with effect from respective effective date. The respective Gas Supply Agreements and Gas Sales Term Sheet with PPL and MPCL require the Company to pay Late Payment Surcharge (LPS), at the rate of six months KIBOR + 2.5% and at an average rate of six months KIBOR + 2.5%, respectively. LPS was also payable under the Old GSAs. The Company, however, has not yet made a final estimate of the amount which the Company shall be liable to pay in respect of LPS; and is currently in negotiation with MPCL and PPL to waive off any LPS. As management is confident that the LPS shall be waived off by the respective parties, the related charges have not been recognized by the Company in these financial statements.

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Further, the Company has claimed LPS from Central Power Purchasing Agency – (Guaranteed) Limited (CPPA – G) due to delayed payments by CPPA-G amounting to Rs. 18,062,870 (2019: Rs. 10,888,455) thousand. However, the Company has not recognized the amount receivable in these financial statements.

Moreover, finalization of agreement with SNGPL is in process, whereas, the Company has ceased to purchase gas from SSGCL. SNGPL have demanded Rs. 13,661,664 (2019: Rs. 10,954,858) thousand as interest on overdue payments. The management of the Company contends that the Company is only liable to pay the interest only after formal terms and conditions have been agreed with these gas suppliers.

- 22.1.3 The Company has withheld payment of its contribution towards the Workers' Profit Participation Fund (WPPF). The matter is pending for decision with the Economic Coordination Committee upon a recommendation submitted by WAPDA to exempt the corporatized entities under its umbrella, from the requirements of the Companies Profit (Workers' Participation) Act, 1968, and accordingly, the Company has not made a provision against WPPF, amounting to Rs. 158 million (2019: 250 million), in respect of the current year.
- 22.1.4 The Assistant Commissioner Inland Revenue (ACIR) passed an order under section 122(1)/(5) of the Ordinance for the tax year 2011 while disallowing certain expenses claimed by the Company and imposition of minimum tax, resulting in an impugned demand of Rs. 35,938 thousand. Being aggrieved, the Company filed an appeal before CIR (Appeals) against impugned order passed by the learned ACIR, which was decided against the Company. Being aggrieved by the order, the Company has filed second appeal before the ATIR, which is pending adjudication. the Company's counsel is of the view that the matter will be decided in favor of the Company, accordingly, no provision has been made in these financial statements.
- 22.1.5 The Company was selected for audit under section 214(c) of the Ordinance for the tax year 2014. On the basis of audit, the assessing officer amended the original assessment under section 122(1) on the observation that the Company has not charged minimum tax under section 113 of the Ordinance, disallowing certain expenses, under different heads of account and thereby created the demand amounting to Rs. 317,213 thousand. Being aggrieved, the Company filed an appeal before the CIR (Appeals), who had granted relief to the extent of minimum tax and on certain expense under section 21(c) of the Ordinance. Accordingly, the Company has filed second appeal before the ATIR, which is pending adjudication. The Company's counsel is of the view that the matter will be decided in favor of the Company, accordingly, no provision has been made in these financial statements.
- 22.1.6 The learned DCIR passed an order under section 11(2) of the Sales Tax Act (the "ST Act") while disallowing input tax claimed by the Company on household appliances ceramic products and laboratory apparatus and thereby created impugned demand amounting to Rs. 417 thousand along with the default surcharge of Rs. 215 thousand and penalty of Rs. 13 thousand for the tax periods from July 2015 to April 2017. Being aggrieved, the Company filed an appeal before the CIR (Appeals), which is pending adjudication. the Company's counsel is of the view that the matter will be decided in favor of the Company, accordingly, no provision has been made in these financial statements.
- 22.2 **Commitments:**
- 22.2.1 Commitments in respect of contracts for capital expenditure amount to Rs. 243,131 (2019: Rs. 773,087) thousand.
- 22.2.2 Commitments in respect of contracts, other than capital expenditure, amount to Rs. 112,169 (2019: Rs. 130,618) thousand
- 22.2.3 The Company has furnished indemnity bonds to the Collector of Customs to avail the exemption under SRO 567 (I) / 2006 dated 05 June 2006 amounting to Rs. 1,905,726 (2019: Rs. 1,905,726) thousand in respect of custom duty payable on account of equipment imported for the Naudero-I Rental Power Project.

23. REVENUE FROM CONTRACT WITH CUSTOMER - NET	Note	2020	2019
		---Rupees in thousands---	
Energy charges		63,678,698	67,941,497
Less: Sales tax	23.1	(7,799,469)	(9,871,841)
Net energy charges		45,879,229	58,069,656
Capacity charges		22,525,833	20,665,956
		<u>68,405,062</u>	<u>78,735,612</u>

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	2020	2019
	---Rupees in thousands---	
Timing of revenue recognition - net		
At a point in time	45,879,229	58,069,656
Over the time	22,525,833	20,865,956
	68,405,062	78,735,612

23.1 This represent sales tax chargeable under federal sales tax laws applicable on revenue as defined under the relevant laws.

	2020	2019
	---Rupees in thousands---	
23.2 Contract balances		
Trade debt	68,273,192	54,184,461

The Company trade debts increased due to less receipts from CPPA-G during the year.

23.3 Performance obligation

Performance obligations are satisfied when capacity is made available and NEO is delivered to CPPA-G over the time and at a point in time respectively

	2020	2019
	-----KWh-----	
23.4 Units sold		
Energy (KWh)	6,921,761,001	9,384,298,202
Capacity (KW) - original	1,640,790	2,120,790

23.4.1 The capacity disclosed above reflects installed capacity of all plants, currently in operation. However, the Company intends to appoint an independent assessor for reassessment of dependable capacity of its plants.

	2020	2019
23.5 Average rates of energy		
Energy charges (Rs. per KWh)	7.75	6.19
Capacity charges (Rs. per KWh per month)	2,533.54	1,888.59

		2020	2019
		---Rupees in thousands---	
24. COST OF REVENUE	Note		
Fuel consumed	24.1	48,414,203	58,081,306
Salaries, wages and other benefits	24.2	5,779,790	4,636,664
Depreciation	5.1.6	5,599,544	4,789,755
Repair and maintenance		1,494,920	594,179
Power, gas and water		377,438	333,260
Insurance		2,182	-
Traveling expenses		58,290	67,335
Vehicle running expenses		34,928	31,327
Stores consumed		19,031	27,887
		61,780,426	68,561,713

24.1 This represents cost of gas consumed in the generation of electricity and includes provision for GIDC amounting to Rs. 5,239,706 thousand (2019: 8,500,293 thousand).

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		2020	2019
		---Rupees in thousands---	
24.2	These include provisions for post employment and other long term benefits as follows:	Note	
	Pension obligations - unfunded	19.3.1	3,039,415
	Medical benefits	19.3.1	400,994
	Free electricity	19.3.1	383,710
	Accumulated compensated absences	19.3.1	(668)
			<u>3,823,451</u>
25.	ADMINISTRATIVE EXPENSES		
	Salaries, wages and other benefits	25.1	435,038
	Management fee		68,908
	Depreciation	5.1.6	114,278
	Repairs and maintenance		203,853
	NEPRA fees		29,995
	Power, gas and water		38,409
	Security expenses		17,724
	Provision for doubtful debt	9	-
	Advertisement		9,677
	Vehicle expenses		11,643
	Legal and professional fees		14,420
	Traveling expenses		4,387
	Office supplies		4,171
	Directors' remuneration		4,654
	Communication charges		3,525
	Miscellaneous expenses		16,513
	Auditors' remuneration	25.2	2,250
	Advances written off		-
			<u>979,445</u>
25.1	These include provisions for post employment and other long term benefits as follows:		
	Pension obligations - unfunded	19.3.1	228,773
	Medical benefits	19.3.1	30,182
	Free electricity	19.3.1	28,881
	Accumulated compensated absences	19.3.1	(50)
			<u>287,786</u>
25.2	Auditors' Remuneration		
	Annual statutory audit		1,800
	Out of pocket expenses		450
			<u>2,250</u>
26.	OTHER INCOME		
	Income from financial assets:		
	Profit on bank deposits		273,556
	Income from other than financial assets:		
	Amortization of deferred grant	18	198,590
	NRV adjustment		-
	Rent		25,775
	Training charges		2,867
	Penalties recovered		2,731
	Electricity charges		14,775
	Sale of scrap material		1,241
	Tender fee		303
	Miscellaneous		10,725
			<u>257,007</u>
			<u>530,563</u>
			140,123
			<u>198,590</u>
			<u>58,164</u>
			<u>14,606</u>
			<u>9,888</u>
			<u>9,175</u>
			<u>8,082</u>
			<u>2,651</u>
			<u>229</u>
			<u>45,681</u>
			<u>347,066</u>
			<u>487,189</u>

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	Note	2020 ---Rupees in thousands---	2019
27. FINANCE COSTS			
Interest on:			
Foreign direct loans		1,818,025	2,281,619
Cash development loans		1,003,798	1,023,973
		2,821,823	3,305,592
Exchange loss on foreign direct loans - realized		-	818,974
Guarantee fee on foreign direct loans		199,812	46,941
Others		11,659	2,086
		3,033,294	4,173,593

28. TAXATION

Current taxation:			
Provision for Minimum Tax / Alternate Corporate Tax	28.1	1,026,095	921,865
Tax credit	28.2	(553,196)	(921,865)
		472,899	-
Deferred taxation		1,460,025	1,477,599
		1,932,924	1,477,599

28.1 The provision for current tax includes Minimum Tax @ 1.5% of turnover for the current year and Alternate Corporate Tax @ 17% of the accounting profit, under the provisions of the Income Tax Ordinance, 2001, as amended by the relevant Finance Acts.

28.2 This represents tax credits awarded to the Company under section 65B of the Income Tax Ordinance, 2001.

28.3 Reconciliation between the tax chargeable on accounting profit and taxable profit is not relevant as the company is subject to minimum tax. Hence, is not presented.

29. TRANSACTIONS WITH RELATED PARTIES

29.1 Particulars of related parties and associated undertakings

The related parties comprise of the Government of Pakistan (GOP), GOP owned entities, WAPDA, associated companies, Directors of the Company and companies with common directorship and key management personnel. A list of all related parties along with percentage of shares is given below:

Associated Company, related party and Undertaking	Basis of relationship	Percentage of shareholding
Government of Pakistan	Shareholding	100%
GENCO Holding Company Limited	Managing entity	N/A
Central Power Purchasing Authority (CPPA-G)	Government related entity	N/A
Faisalabad Electric Supply Company Limited	Government related entity	N/A
Gujranwala Electric Power Company Limited	Government related entity	N/A
Hyderabad Electric Supply Company Limited	Government related entity	N/A
Quetta Electric Supply Company Limited	Government related entity	N/A
Islamabad Electric Supply Company Limited	Government related entity	N/A
Lahore Electric Supply Company Limited	Government related entity	N/A
Multan Electric Power Company Limited	Government related entity	N/A
Peshawar Electric Supply Company Limited	Government related entity	N/A
Sukkur Electric Power Company Limited	Government related entity	N/A
National Transmission and Dispatch Company Limited	Government related entity	N/A
Jamshoro Power Company Limited (GENCO-I)	Government related entity	N/A
Northern Power Generation Company Limited (GENCO-III)	Government related entity	N/A
Lakhra Power Generation Company Limited (GENCO-IV)	Government related entity	N/A
Sui Southern Gas Company Limited (SSGCL)	Government related entity	N/A
Sui Northern Gas Pipelines Limited (SNGPL)	Government related entity	N/A
Mari Petroleum Company Limited (MPCL)	Government related entity	N/A
Pakistan Petroleum Limited (PPL)	Government related entity	N/A
WAPDA	Government related entity	N/A
Chief Resident Representative Karachi - WAPDA	Government related entity	N/A

29.2 Transactions with related parties:

Transactions with related parties are entered into at mutually agreed terms. The sale / purchase prices of electricity are controlled by the NEPRA. The Company in the normal course of business carries out transactions with various related parties. Amounts due from related parties are disclosed in the relevant notes to these financial statements. Transactions not disclosed elsewhere are as follows:

Associated Undertakings		2020	2019
		---Rupees in thousands---	
CPPA-G	Electricity sales	76,204,531	88,607,453
	Funds received during the year	62,115,800	46,696,000
WAPDA, associated companies	Electricity and other utility purchases	71,423	52,119
	Credit Movement	848,539	885,504
Government of Pakistan	Interest and guarantee fee on long-term financing	1,203,610	1,070,914
SNGPL	Purchase of gas	7,860,805	15,210,496
	Payments made during the year	8,877,345	6,689,942
PPL	Purchase of gas	35,771,051	31,871,483
	Payments made during the year	19,779,392	12,499,462
MPCL	Purchase of gas	13,013,630	21,121,880
	Payments made during the year	12,062,063	7,642,596
GENCO Holding Company Limited	Management Fee, other utility purchases	95,972	120,738

Other transactions with the GOP, and GOP owned entities are not disclosed, as management is of the opinion that it is impracticable to disclose such transactions due to the nature of the Company's operations.

The transactions with key management personnel under the terms of employment are disclosed in Note 30.

30. REMUNERATION OF THE CHIEF EXECUTIVE, DIRECTORS AND EXECUTIVES

The aggregate of amounts charged in the financial statements for the remuneration including benefits paid to the Chief Executive, Directors and Executives of the Company, are given below:

	2020		
	Chief Executive	Directors	Executives
	-----Rupees in thousands-----		
Managerial remuneration	8,507	4,654	102,788
Bonus	1,020	-	740
	<u>9,527</u>	<u>4,654</u>	<u>103,528</u>
Number of person(s)	<u>1</u>	<u>8</u>	<u>37</u>
	2019		
	Chief Executive	Directors	Executives
	-----Rupees in thousands-----		
Managerial remuneration	3,454	4,524	68,628
Bonus	164	-	3,538
	<u>3,618</u>	<u>4,524</u>	<u>72,166</u>
Number of person(s)	<u>1</u>	<u>8</u>	<u>29</u>

In addition, the Chief Executive is also provided with a Company maintained vehicle for official and private purposes, unfurnished residential accommodation and free electricity as per entitlement.

30.1 The aggregate amount charged in these financial statements, for the year ended 30 June 2020, as fees to Directors is Rs. 4,445 thousand (2019: 4,524 thousand) for attending the meetings of the Board of Directors and its sub-committees.

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31. FINANCIAL RISK MANAGEMENT

The Company's principal financial liabilities, other than derivatives, comprise long-term borrowings, Interest accrued on long term financing and trade and other payables. The main purpose of these financial liabilities is to finance the Company's operations. The Company's principal financial assets include trade debts, loan to related party, other receivables, bank balances and long-term deposits that derive directly from its operations

The Company is exposed to market risk, credit risk and liquidity risk. The Company's senior management oversees the management of these risks. The Company's senior management is supported by a risk management committee that advises on financial risks and the appropriate financial risk governance framework for the Company. The risk management committee provides assurance to the Company's senior management that the Company's financial risk activities are governed by appropriate policies and procedures and that financial risks are identified, measured and managed in accordance with the Company's policies and risk objectives. The Board of Directors reviews and agrees policies for managing each of these risks, which are summarized below.

31.1 Market risk

Market risk is the risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in market prices. Market risk comprises three types of risk: interest rate risk, currency risk and other price risk, such as equity price risk and commodity risk.

The sensitivity analyses in the following sections relate to the position as at 30 June in 2020 and 2019.

The sensitivity analyses have been prepared on the basis that the amount of net debt, the ratio of fixed to floating interest rates of debt and the proportion of financial instruments in foreign currencies are all constant.

The analyses exclude the impact of movements in market variables on: the carrying values of pension and other post-retirement obligations; and provisions.

i) Foreign currency risk

Foreign currency risk is the risk that the fair value or future cash flows of an exposure will fluctuate because of changes in foreign exchange rates. Currency risk arises mainly from future commercial transactions or receivables and payables that exist due to transactions in foreign currencies. The Company's exposure to the risk of changes in foreign exchange rates relates primarily to the Company's operating activities (when revenue or expense is denominated in a foreign currency) and the Company's payments against foreign direct loans.

Following is the gross exposure classified into separate foreign currencies:

	2020	2019	2020	2019
	-----USD-----		-----Euros-----	
Long-term financing	231,913,422	283,449,738	-	-
Interest accrued on long term financing	4,430,001	6,616,196	-	-
Trade payables	27,360,328	44,875,000	739,093	739,093.00
	<u>263,703,751</u>	<u>334,940,934</u>	<u>739,093</u>	<u>739,093</u>

Significant exchange rates applied as at year end were as follows:

	2020	2019	2020	2019
	----USD----		----Euros----	
Rupees per foreign currency				
Reporting date rate	168.75	164.50	189.73	186.99
Average rate during the year	<u>165.63</u>	<u>143.05</u>	<u>188.36</u>	<u>164.28</u>

Foreign currency sensitivity

The following tables demonstrate the sensitivity to a reasonably possible change in USD and Euros exchange rates, with all other variables held constant.

	Change in USD Rate	Effects on Profit Before Tax Rupees in thousands	Change in Euro Rate	Effects on Profit Before Tax Rupees in thousands
2020	+5%	2,225,000	+5%	7,011
	-5%	(2,225,000)	-5%	(7,011)
2019	+5%	2,754,889	+5%	6,910,150
	-5%	(2,754,889)	-5%	(6,910,150)

The Company's exposure to foreign currency changes for all other currencies is not material.

ii) Interest rate risk

Interest rate risk is the risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in market interest rates. The Company manages its interest rate risk by having a balanced portfolio of fixed and variable rate loans and borrowings.

At the reporting date the interest rate profile of the Company's interest-bearing financial assets/(liabilities) was as follow:

	2020	2019
	---Rupees in thousands---	
Fixed rate instruments		
Long-term financing - foreign relent loans	133,854	133,854
Long-term financing - cash development loans	8,044,538	8,044,538
	<u>8,178,392</u>	<u>8,178,392</u>
Floating rate instruments		
Bank balances	10,166,613	6,105,556
Long-term financing - foreign direct loans	39,135,390	46,627,483
	<u>49,302,003</u>	<u>52,733,039</u>

Fair value sensitivity analysis for fixed rate instruments

The Company does not account for any fixed rate financial assets and liabilities at fair value through profit or loss. Therefore, a change in interest rates at the reporting date would not affect the profit or loss of the Company.

Cash flow sensitivity analysis for variable rate instruments

If interest rates at the year end date, fluctuates by 1% higher / lower with all other variables held constant, profit before taxation for the year would have been changed as following.

Changes in interest rate	2020	2019
	---Rupees in thousands---	
+1%	<u>493,020</u>	<u>527,330</u>
-1%	<u>(493,020)</u>	<u>(527,330)</u>

This analysis is prepared, consistent from previous year, assuming the amounts of floating rate instruments outstanding at reporting date were outstanding for the whole year.

ii) Other price risk

Other price risk is the risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in market prices (other than those arising from currency risk or interest rate risk), whether those changes are caused by factors specific to the individual financial instrument or its issuer, or factors affecting all similar financial instruments traded in the market.

The Company is not exposed to any other price risks i.e. equity price risk and commodity price risk.

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31.2 Credit risk

Credit risk is the risk that a counterparty will not meet its obligations under a financial instrument or customer contract, leading to a financial loss. The Company considers a financial asset in default when contractual payments are 30 days past due. However, in certain cases, the Company may also consider a financial asset to be in default when internal or external information indicates that the Company is unlikely to receive the outstanding contractual amounts in full before taking into account any credit enhancements held by the Company.

The management monitors and limits Company's exposure to credit risk through monitoring of client's credit exposure review and conservative estimates of expected credit loss, if any, and through the prudent use of collateral policy.

	2020	2019
	---Rupees in thousands---	
The maximum exposure to the credit risk at the reporting date was as follows:		
Bank balances	10,166,613	6,105,556
Trade debt	68,273,192	54,184,461
Long term deposits	281	281
Loan to related party	424,770	238,617
Other receivables	1,003,410	1,021,618
	79,868,266	61,550,533

i) Bank balances

Credit ratings both short-term and long-term of the banks along with the bank balances as of year end are as follows:

Bank	Rating				
	Short term	Long term	Agency	---Rupees in thousands---	
United Bank Limited	A-1+	AAA	JCR - VIS	2,030,486	903,250
Habib Bank Limited	A-1+	AAA	JCR - VIS	1,818,064	968,208
National Bank of Pakistan	A-1+	AAA	JCR - VIS	6,318,063	4,234,098
				10,166,613	6,105,556

Due to the Company's long-standing business relationships with these financial institutions and after giving due consideration to their strong financial standing, the management does not expect non-performance by these counterparties on their obligations to the Company. Further, the Company has assessed that the ECL on bank balances is immaterial and hence, has not been recognized.

ii) Trade debt

The trade receivable is with the Company's sole customer i.e. CPPA-G, an associated company, age analysis of which is as follows:

	2020	2019
	---Rupees in thousands---	
Neither past due nor impaired		
Past due but not impaired		
0 to 3 Months (0 - 90 days)	15,065,000	30,611,556
4 to 6 Months (91 - 180 days)	13,908,805	14,850,482
7-12 Months	23,814,250	1,452,442
Over 12 Months	16,201,763	7,976,607
	68,979,818	54,891,087
	68,979,818	54,891,087

The Company has not recorded ECL against the balance receivable from CPPA-G, a government owned entity, in accordance with the exemption granted by SECP as disclosed in Note 4.12.

31.3 Liquidity risk

Liquidity risk is the risk that an entity will encounter difficulty in meeting obligations associated with financial liabilities.

The Company's approach to managing liquidity is to ensure, as far as possible, that it will always have sufficient liquidity to meet its liabilities when due, under both normal and stressed conditions, without incurring unacceptable losses or risking damage to the Company's reputation. Due to the support of the Federal Government, management believes the liquidity risk to be low.

The table below analyses the Company's financial liabilities into relevant maturity groupings based on the remaining period at the reporting date to the contractual maturity date. The amounts disclosed in the table are the contractual undiscounted cash flows. Balances due within 12 months equate to their carrying balances, as the impact of discounting is not significant.

	On demand	Less than 12 months	1 to 5 years	Over 5 years	Total
-----Rupees in thousands-----					
2020					
Long term financing	759,843	8,886,981	31,430,314	6,236,644	47,313,782
Trade and other payables	43,081	104,417,559	-	-	104,460,640
Interest accrued on long term financing	6,737,952	747,563	-	-	7,485,515
	<u>7,540,876</u>	<u>114,052,103</u>	<u>31,430,314</u>	<u>6,236,644</u>	<u>159,259,937</u>
2019					
Long-term financing	458,640	8,778,927	34,817,622	10,750,686	54,805,875
Trade and other payables	23,304	89,932,179	-	-	89,955,483
Interest accrued on long term financing	5,534,341	1,088,364	-	-	6,622,705
	<u>6,016,285</u>	<u>99,799,470</u>	<u>34,817,622</u>	<u>10,750,686</u>	<u>151,380,063</u>

Further, as at 30 June 2020, the Company is also contracted to pay interest on its long term financing. An estimate of interest in respect of the remaining terms of these loans is as follows:

	Rupees in thousands
Due in next year	2,575,432
Due after 1 year with in 5 years	6,250,295
Due after 5 years	5,586,603
	<u>14,412,330</u>

31.4 Financial instruments by categories

	2020 Financial assets at amortized cost	2019 Financial assets at amortized cost
----Rupees in thousands----		
Assets as per statement of financial position		
Bank balances	10,166,613	6,105,556
Trade debt	68,273,192	54,184,461
Long term deposits	281	281
Loan to related party	424,770	238,617
Other receivables	1,003,410	1,021,618
	<u>79,868,266</u>	<u>61,550,533</u>
Liabilities as per statement of financial position		
Long term financing	47,313,782	54,805,875
Trade and other payables	104,449,567	89,952,104
Interest accrued on long term financing	7,485,515	6,622,705
	<u>159,248,864</u>	<u>151,380,684</u>

32. FAIR VALUE MEASUREMENTS**32.1 Fair value hierarchy**

The Company uses the following hierarchy for determining and disclosing the fair value of financial instruments by valuation techniques:

Level 1: quoted (unadjusted) prices in active markets for identical assets or liabilities;

Level 2: other techniques for which all inputs, which have a significant effect on the recorded fair value, are observable either, directly or indirectly; and

Level 3: techniques which use inputs that have a significant effect on the recorded fair value, that are not based on observable market data.

32.2 Fair value of financial instruments

The carrying values of all financial assets and liabilities reflected in the financial statements are stated at cost as the carrying amounts are a reasonable approximation of fair value.

As at 30 June 2020 and 2019, the Company did not hold any financial instrument carried at fair value.

32.3 Financial instruments by categories

	2020 Financial assets at amortized cost	2019 Financial assets at amortized cost
	---Rupees in thousands---	
Assets as per statement of financial position		
Bank balances	10,166,613	6,105,556
Trade debt	68,273,192	54,184,461
Long term deposits	281	281
Loan to related party	424,770	238,617
Other receivables	1,003,410	1,021,618
	<u>79,868,266</u>	<u>61,550,533</u>
Liabilities as per statement of financial position		
Long term financing	47,313,782	54,805,875
Trade and other payables	104,449,567	89,952,104
Interest accrued on long term financing	7,485,515	6,622,705
	<u>159,248,864</u>	<u>151,380,684</u>

33. CAPITAL MANAGEMENT

The primary objective of the Company's capital management is to ensure that it maintains a strong credit rating and healthy capital ratios in order to support its business and maximize shareholders' value. The Company manages its capital structure and makes adjustments to it in the light of changes in economic conditions. The Board of Directors monitors the returns on capital, which the Company defines as net operating income divided by total shareholders' equity. The Company's objectives when managing capital are:

- to safeguard the entity's ability to continue as a going concern, so that it can continue to provide returns for shareholders and benefits for other stakeholders; and
- to provide an adequate return to shareholders by pricing products.

Consistent with the industry norms, the Company monitors its capital on the basis of gearing ratio. The ratio is calculated as net debt divided by total capital. Net debt is calculated as total borrowings and loans as shown in the balance sheet less cash and bank balances. Total capital is calculated as 'equity' as shown in the statement of financial position plus net debt (as defined above).

	2020	2019
	---Rupees in thousands---	
Long term financing	47,313,782	54,805,875
Less Bank balances	(10,166,613)	(6,105,556)
Net debt	37,147,169	48,700,319
Total equity	(1,418,290)	(2,273,862)
Total capital employed	<u>35,728,879</u>	<u>46,426,457</u>
Gearing ratio	<u>104%</u>	<u>105%</u>

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The Company's strategy is to ensure compliance with the Prudential Regulations issued by the State Bank of Pakistan and is in accordance with agreements executed with financial institutions so that the total long term borrowings to equity ratio does not exceed the lender covenants. Breaches in meeting the financial covenants would permit the bank to immediately call loans and borrowings. There have been no breaches of the financial covenants of any interest-bearing loans and borrowing in the current period.

34. APPLICABILITY OF IFRS 16 "LEASES"

SECP, through its S.R.O. no.24(I)/2012 dated January 16, 2012 and S.R.O 986(I)/2019, dated September 02, 2019, exempted the application of IFRS - 16 (Leases) for power sector companies to the extent of the power purchase agreements (PPA) executed before the effective date of IFRS 16 i.e. 01 January 2019. The PPA for 747 MW plant is not yet executed, accordingly the Company will assess the applicability of IFRS - 16 with respect to this plant at the time of execution of PPA. However, SECP has made it mandatory to disclose the impact on the results of the application of IFRS - 16

	2020	2019
	--- Rupees in thousands ---	
(Increase) / decrease in accumulated losses at the beginning of the year	(9,683,791)	2,665,980
Decrease in profit for the year - net	<u>(1,079,513)</u>	<u>(12,249,751)</u>
Increase in accumulated losses at the end of the year	<u>(10,663,304)</u>	<u>(9,583,791)</u>

The above disclosure is restricted to 747 MW plant as impact for remaining rehabilitated plants is considered to be immaterial.

35. IMPACT OF NON-CAPITALIZATION OF EXCHANGE LOSS

SECP, through its S.R.O 986(I)/2019, dated September 2, 2019, exempted the power companies from application of IFRS - 9 to the extent of recognition of embedded derivative and IAS-21 to the extent of charging exchange losses (refer to Note 2 for details).

Had the IAS-21 been applied, following adjustments to the financial statement line items would have been made.

	Accumulated losses	Property, plant and equipment
	Decrease	Decrease
	---Rupees in thousands---	
Change due to non-capitalization of exchange loss as at 01 July 2018	(6,395,657)	6,395,657
Charge off of exchange loss for the year	(14,151,135)	14,151,135
Change due to non-capitalization of exchange loss as at 30 June 2019	<u>(20,546,792)</u>	<u>20,546,792</u>
Charge off of exchange loss for the year	(666,821)	666,821
Change due to non-capitalization of exchange loss as at 30 June 2020	<u>(21,213,613)</u>	<u>21,213,613</u>

36. PLANT CAPACITY AND ACTUAL PRODUCTION

Based on 365 days

Annual installed capacity - original

Actual output

	2020	2019
	-----MWh-----	
Annual installed capacity - original	<u>14,373,320</u>	<u>18,807,720</u>
Actual output	<u>5,921,761</u>	<u>9,384,298</u>

36.1 Under utilization of available capacity is due to non-operational plants of the Company.

CENTRAL POWER GENERATION COMPANY LIMITED

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37. NUMBER OF PERSONS EMPLOYED

2020 2019
-----Numbers-----

At the end of the year

1,702 1,830

Average number of employees during the year

1,766 1,891

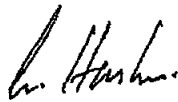
38. GENERAL

Figures have been rounded off to the nearest thousands of Pak Rupees, unless otherwise stated.

39. DATE OF AUTHORIZATION

These financial statements have been authorized for issue by the Board of Directors of the Company on

04 MAR 2021



CHIEF EXECUTIVE



DIRECTOR

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ANNEX-I

EXPRESSION OF INTEREST TO PROVIDE CREDIT OR FINANCING

No.F.1 (1)-CF.I/2009-10/1437
Government of Pakistan
Finance Division

Islamabad, the 16th July, 2010.

From : Javed Iqbal,
Section Officer (CF.I).

To : The Accountant General
Pakistan Revenues,
Islamabad.

SUBJECT: RELEASE OF RS.5,100,000,000 AS CASH DEVELOPMENT LOANS TO PEPCO

Sir,

I am directed to convey sanction of the President of Islamic Republic of Pakistan for payment of Rs.5,100,000,000 (Rupees Five billion one hundred million only) to PEPCO as Cash Development Loan for financing of "747 MW Combined Cycle Power plant -Guddu" for FY 2010-11. The terms and conditions of the loan are as under:-

"The loan will be recoverable in 20 years along-with interest with a grace period of five years for recovery of principle amount. The interest will be chargeable at the prevailing rate for the respective year."

2. The Cheque for the amount is to be drawn by the DDO, Finance Division Islamabad in the form of cross Cheque which will be credited to PEPCO's Account No.NIDA 17-7 maintained with National Bank of Pakistan, Gardee Trust Branch, Lahore. (Vender No.).

3. The expenditure involved is debitible to the Functional-Cum-Object Classification "01-General Public Services, 014-Transfers, 0142-Transfers (Others), 014202-Transfers to Non-Financial Institutions, 014202-A08-Loans and Advances, 014202-A085-Non-Financial Institutions, 014202-A08501-Loans to Non-Financial Institutions, ID 5463-WAPDA (Power Wing) under Demand No.176 (FC12D36): Development Loans and Advances by the Federal Government and will be met through supplementary grant of the Finance Division during FY 2010-11. The schedule of supplementary grant is enclosed.

Yours obedient servant,

Javed Iqbal
(Javed Iqbal)
Section Officer (CF.I)

Establishment Division
Office of the DFA (Finance)

Dy.No. 268 -DFA (Finance)/2009-10/

Islamabad, the 16th July, 2010

Forwarded to AGPR, Islamabad.

Masha Khan
(MASHA KHAN)
Deputy Financial Adviser (Finance)

Copy forwarded to:-

- 1) Secretary, Ministry of Water and Power, Islamabad.
- 2) General Manager Finance, PEPCO, WAPDA House, Lahore.
- 3) Director General (Federal Audit), F.8 Markaz, Islamabad.
- 4) AGPR Sub Office, Lahore.
- 5) Ministry of Water & Power, DS (Water)/DS (Power), Islamabad.
- 6) Coordinator (MoF), DS (BR), DS (BIU), CF&AO (Finance), DFA (W&P), SO (B&A), SO (PR-III), AO (R&A) and AO (CF), Finance Division, Islamabad.
- 7) Planning & Development Division (i) Chief, Resources and (ii) Chief Investment Programming, Government of Pakistan, Islamabad
- 8) Chief Programmer Budget Wing Finance Division Islamabad.
- 9) DDO, Finance Division Islamabad

Javed Iqbal
Section Officer (CF.I)

Not to Account Only

(P) 2748727

GOVERNMENT OF PAKISTAN

Cheque No. 2748727

Token No: 257590-BCT

A/C No.

A/C Type

NON FOOD A/C

Pre-Audit Cheque

Dated

03.08.2010

Department

Office of

Office of AGPR, Islamabad

147 MW COMBINED CYCLE POWER PLANT GURDU

ISLAMABAD

On the

State Bank of Pakistan

National Bank of Pakistan

Pay to

PEPCO'S ACCOUNT NO. NIDA 17-7 RDP CAREER TRUST, DR LAHORE

Rs.

+++5,100,000,000/++Rupees

FIVE BILLIONS ONE HUNDRED MILLION ONLY

and charge the same against the account of the Government of Pakistan

N.B. This cheque is current for three months only after the month of issue.

DO NOT WRITE BELOW THIS LINE

Assistant Accountant General
Accounts Officer

Not More than RS. 5,100,000,000/-

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No.F.1 (I)-CF.I/2009-10-265
Government of Pakistan
Finance Division

Islamabad, the 25th March
February, 2011.

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From : Javed Iqbal,
Section Officer (CF.I).
To : The Accountant General
Pakistan Revenues,
Islamabad.

SUBJECT: RELEASE OF RS.2,600,000,000 AS CASH DEVELOPMENT LOANS TO PEPCO

Sir,

I am directed to convey sanction of the President of Islamic Republic of Pakistan for payment of Rs.2,600,000,000 (Rupees Two billion Six hundred million only) to PEPCO as Cash Development Loan for financing of "747 MW Combined Cycle Power plant -Guddu" for FY 2010-11. The terms and conditions of the loan are as under:-

"The loan will be recoverable in 20 years along-with interest with a grace period of five years for recovery of principle amount. The interest will be chargeable at the prevailing rate for the respective year."

2. The Cheque for the amount is to be drawn by the DDO, Finance Division Islamabad in the form of cross Cheque which will be credited to PEPCO's Account No NIDA 17-7 maintained with National Bank of Pakistan, Gardee Trust Branch, Lahore. (Vender No.30102456).

3. The expenditure involved is debit to the Functional-Cum-Object Classification "01-General Public Services, 014-Transfers, 0142-Transfers (Others), 014202-Transfers to Non-Financial Institutions, 014202-A08-Loans and Advances, 014202-A085-Non-Financial Institutions, 014202-A08501-Loans to Non-Financial Institutions, ID 5463-WAPDA (Power Wing) under Demand No.176 (FC12D36): Development Loans and Advances by the Federal Government and will be met through supplementary grant of the Finance Division during FY 2010-11. The schedule of supplementary grant is enclosed.

Yours obedient servant,

Javed
(Javed Iqbal)
Section Officer (CF.I)

Establishment Division
Office of the DFA (Finance)

Dy.No 2258-DFA (Finance)/2009-10/

Forwarded to AGPR, Islamabad.

Islamabad, the 5th March
February, 2011



Imran Jamil Shami
(IMRAN JAMIL SHAMI)
Deputy Financial Adviser (Finance)

Copy forwarded to:-

- 1) Secretary, Ministry of Water and Power, Islamabad
- 2) General Manager Finance, PEPCO, WAPDA House, Lahore.
- 3) Director General (Federal Audit), F.8 Markaz, Islamabad.
- 4) AGPR Sub Office, Lahore.
- 5) Ministry of Water & Power, DS (Water)/DS (Power), Islamabad.
- 6) Coordinator (MoF), DS (BR), DS (BIU), CF&AO (Finance), DFA (W&P), SO (B&A), SO (PF-III), AO (F&A) and AO (CF), Finance Division, Islamabad.
- 7) Planning & Development Division (i) Chief, Resources and (ii) Chief Investment Programming, Government of Pakistan, Islamabad
- 8) Chief Programmer Budget Wing Finance Division Islamabad.
- 9) DDO, Finance Division Islamabad

Javed
Section Officer (CF.I)

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Token No: 38-577

GOVERNMENT OF PAKISTAN

Cheque No: 3104782

A/C No. A/C Type NON FOOD A/C Pre-Audit Cheque Dated 09.06.2011

Department Office of the AGPR, Islamabad

Office of 741-W2 COMBINED CYCLE POWER PLANT GUSKO

On the State Bank of Pakistan National Bank of Pakistan ISLAMABAD

Pay to PEPCO'S ACCOUNT NO: RICA 17- NBP GAREE TRUST BK LAHORE

Rs. ***2,600,000,000/-*** Rupees TWO BILLIONS SIX HUNDRED MILLION ONLY

and charge the same against the account of the Government of Pakistan
N.B. This cheque is current for three months only after the month of issue

This Cheque is Valid up to 30.06.2011

[Signature]
Assistant Accountant General
Accounts Officer

Not More than Rs. 2,600,000,000/-

DO NOT WRITE BELOW THIS LINE

No.F.1 (1)-CF.I/2009-10/725

Government of Pakistan

Finance Division

Islamabad, the 17th May, 2012.

From : Roidar Ali,
Section Officer (CF.I).

To : The Accountant General
Pakistan Revenues,
Islamabad.

SUBJECT: RELEASE OF RS.3,600,000,000 AS CASH DEVELOPMENT LOANS TO PEPCO

Sir,

I am directed to convey sanction of the President of Islamic Republic of Pakistan for payment of Rs.3,600,000,000 (Rupees Three Billion Six Hundred Million Only) to PEPCO as Cash Development Loan for financing of "747 MW Combined Cycle Power Plant - Guddu" for FY 2011-12. The terms and conditions of the loan are as under:-

"The loan will be recoverable in 20 years along-with interest with a grace period of five years for recovery of principle amount. The interest will be chargeable at the prevailing rate for the respective year."

2. The Cheque for the amount is to be drawn by the DDO, Finance Division Islamabad in the form of cross Cheque which will be credited to PEPCO's Account No NIDA 17-7 maintained with National Bank of Pakistan, Gardee Trust Branch, Lahore: (Vender No.30102456).

3. The expenditure involved is debitable to the Functional-Cum-Object Classification "01-General Public Services, 014-Transfers, 0142-Transfers (Others), 014202-Transfers to Non-Financial Institutions, 014202-A08-Loans and Advances, 014202-A085-Non-Financial Institutions, 014202-A08501-Loans to Non-Financial Institutions, ID 5463-PEPCO/WAPDA (Power Wing) under Demand No.131 (FC12D36): Development Loans and Advances by the Federal Government and will be met through supplementary grant of the Finance Division during FY 2011-12. The schedule of supplementary grant is enclosed.

Roidar Ali
(Roidar Ali)

Section Officer (CF.I)

Establishment Division
Office of the DFA (Finance)

Dy.No/80 -DFA (Finance)/2011-12/

Islamabad, the 17th May, 2012

Forwarded to AGPR, Islamabad.

Muhammad Khan
Deputy Financial Adviser (Finance)

Copy forwarded to:-

- 1) Secretary, Ministry of Water and Power, Islamabad.
- 2) Managing Director, PEPCO, WAPDA House, Lahore.
- 3) Director General (Federal Audit), F.8 Markaz, Islamabad.
- 4) AGPR Sub Office, Lahore.
- 5) Ministry of Water & Power, DS (Water)/DS (Power), Islamabad.
- 6) Coordinator (MoF), DS (BR), DS (BIU), CF&AO (Finance), DFA (W&P), SO (B&A), SO (PF-III), AO (F&A) and AO (CF), Finance Division, Islamabad.
- 7) Planning & Development Division (i) Chief, Resources and (ii) Chief Investment Programming, Government of Pakistan, Islamabad
- 8) Assistant Chief (PIP), Planning & Development Division w.r.t. letter No.4(1-54)/PIP/PC/2011-12 dated 24-04-2012.
- 9) Chief Programmer Budget Wing Finance Division Islamabad.
- 10) DDO, Finance Division Islamabad

Section Officer (CF.I)

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Token No: 3831174

GOVERNMENT OF PAKISTAN

Cheque No. 3831174

Token No: 399470-bgt

NON FOOD A/C

Pre-Audit Cheque

Dated 28.05.2012

Particulars of the A/C

Office of 147 MW Combined Cycle Power Plant Guddu

On the State Bank of Pakistan National Bank of Pakistan
Pay to PEPCO'S ACCOUNT NO. WIDA 17-7 MBF GARRI TRUST BR KARORI

ISI AMARAN

Rs. ***1,600,000,000/-*** Rupees THREE BILLIONS SIX HUNDRED MILLION ONLY

and charge the same against the account of the Government of Pakistan
N.B. This cheque is valid for three months only after the month of issue or 30th June, whichever is earlier.

DO NOT WRITE BELOW THIS LINE

Not more than Rs. 3,600,000,000/-

Assistant Accountant General
Accounts Officer



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19 October 2015

Central Power Generation Company Limited (GENCO-II)
Thermal Power Station
Guddu – District Kashmore
Sindh
Pakistan

Direct line: +44 207 991 6282
Direct fax: +44 207 992 4428

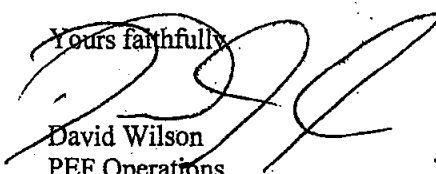
For the attention of: Muhammad Imran, Finance Director


Dear Sirs

**FACILITY AGREEMENT DATED 23 DECEMBER 2011 RELATING
TO AN EXPORT FACILITY IN CONNECTION WITH THE SUPPLY
INSTALLATION AND COMMISSIONING OF A 747 MW GAS
TURBINE COMBINED CYCLE POWER PLANT AT GUDDU
SUPPORTED BY SINOSURE – OUR REFERENCE: 53M/FC1372**

Following receipt on 19 October 2015 of your email confirming cancellation of the residual balance with value 17 September 2015, please be advised that in accordance with Clause 5.2, we provide two (2) copies of the Final Repayment Schedule for the Loan specifying the Repayment Dates and amount of each Repayment Instalment to be made in accordance with Clause 5.1 (*Repayment*). As required by the SINOSURE Agreement, the Borrower shall acknowledge receipt of such repayment schedule and cause it to be signed by an Authorised Officer of the Borrower and returned to the Agent within five (5) Business Days of it's receipt from the Agent.

Yours faithfully


David Wilson
PEF Operations,
Corporate Trust and Loan Agency, Europe


HSBC Bank plc
Global Banking and Markets
HSBC Securities Services
Corporate Trust & Loan Agency
Level 27, 8 Canada Square, London E14 5HQ
Tel: +44 20 7991 8888 Fax: +44 20 7992 4761

Registered in England number 14259. Registered Office: 8 Canada Square, London E14 5HQ
Authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority
RESTRICTED

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REPAYMENT SCHEDULE FOR Sinosure BACKED LOAN FACILITY FOR USD 464M

DATED 23 DECEMBER 2011

REPAYMENT DATE	PRINCIPAL AMOUNT	OUTSTANDING LOAN PRINCIPAL
21 January 2016 ✓	\$25,768,157.96	\$438,058,685.32
21 July 2016 ✓	\$25,768,157.96	\$412,290,527.36
23 January 2017 ✓	\$25,768,157.96	\$386,522,369.40
24 July 2017 ✓	\$25,768,157.96	\$360,754,211.44
22 January 2018 ✓	\$25,768,157.96	\$334,986,053.48
23 July 2018 ✓	\$25,768,157.96	\$309,217,895.52
22 January 2019 ✓	\$25,768,157.96	\$283,449,737.56
22 July 2019 ✓	\$25,768,157.96	\$257,681,579.60
21 January 2020 ✓	\$25,768,157.96	\$231,913,421.64
21 July 2020 ✓	\$25,768,157.96	\$206,145,263.68
21 January 2021 ✓	\$25,768,157.96	\$180,377,105.72
21 July 2021 ✓	\$25,768,157.96	\$154,608,947.76
24 January 2022 ✓	\$25,768,157.96	\$128,840,789.80
21 July 2022 ✓	\$25,768,157.96	\$103,072,631.84
23 January 2023 ✓	\$25,768,157.96	\$77,304,473.88
24 July 2023 ✓	\$25,768,157.96	\$51,536,315.92
22 January 2024 ✓	\$25,768,157.96	\$25,768,157.96
22 July 2024 ✓	\$25,768,157.96	\$0.00
TOTAL PRINCIPAL DRAWN	\$463,826,843.28	

CONFIRMED AS TRUE


[Signature]

 FOR ON ON BEHALF
 OF HSBC BANK PLC
 AS ECA AGENT
 DATE 21/09/2015.....

ACKNOWLEDGMENT

[Signature]

 MUHAMMAD KHALIL ALAMI
 FOR ON ON BEHALF
 OF CENTRAL POWER GEN CO
 AS BORROWER
 DATE 30/Oct/2015.....



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HIGHLY RESTRICTED

(165)

NET WORTH, EQUITY AND DEBT RATIOS

Central Power Generation Company Limited

FINANCIAL DATA

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	Rs. In Million
Description	2019-20 Audited
PROFIT AND LOSS ACCOUNT	
Revenue	68,405
Cost of good sold	(61,780)
Gross profit/(Loss)	6,625
Operating profit/(Loss)	5,645
Profit/(Loss) before tax	3,142
Net Profit/(Loss) after tax	1,210
Earnings before interest, taxes, depreciation and amortisation	11,691
BALANCE SHEET	
Issued, Subscribed and Paid up Share Capital	1
Accumulated Loss	(4,763)
Deposit for shares	3,344
Equiry	(1,418)
Long Term Loans	37,667
Long Term Trade Creditors	2,310
Deferred grant	199
Deferred Liabilities -Employees Benefits	30,901
NON-CURRENT LIABILITIES	71,076
Current portion of Long Term Loans	9,647
Creditors, Accrued and other Liabilities	111,946
CURRENT LIABILITIES	121,593
TOTAL LIABILITIES	191,251
Property, Plant and Equipment	101,902
Long Term Loans and Advances	52
NON-CURRENT ASSETS	101,954
Fuel Stock	928
Stores, Spares and Loose Tools	3,634
Trade Debts	68,273
Loans, Advances, Deposits and Prepayments	6,296
Cash and Bank Balances	10,167
CURRENT ASSETS	89,298
TOTAL ASSETS	191,251
LIQUIDITY RATIOS	
Current ratio	0.73
Quick ratio	0.70
Debt Ratios	
Debt to Asset Ratio	0.20
Debt to Equity Ratio	(26.56)
Debt to EBITDA Ratio	3.22

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ANNEX-J

COMPANY PROFILE

J

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**CENTRAL POWER GENERATION COMPANY LIMITED
(GENCO-II)**



COMPANY PROFILE

A) General Information

<i>Company Name</i>	Central Power Generation Company Limited
<i>Registered Office</i>	197-WAPDA House, Lahore
<i>Mailing Address</i>	Office of Chief Executive Officer, CPGCL, Thermal Power Station, Guddu
<i>City</i>	Guddu
<i>Country</i>	Pakistan
<i>Phone</i>	0722679088
<i>Fax</i>	0722578328
<i>e-mail</i>	genco2_guddu@yahoo.com

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B) Legal Structure

<i>Type of Enterprise</i>	Unlisted Public Company
<i>Company Reg. No.</i>	0039566
<i>Date of Incorporation</i>	28 October 1998
<i>Company Business</i>	Electric Power Generation
<i>Regulatory License (NEPRA)</i>	License No. GL/02/2002 dated 01-07-2002
<i>NTN</i>	3049718-3
<i>STRN</i>	0304271600619

C) Key Persons

<i>Chief Executive Officers</i>	Mr. Sabeeh uzzaman Faruqui
<i>Chief Financial Officer</i>	Mr. Tahir Rehman Kayani
<i>Company Secretary</i>	Mr. Saad Shabbir

D) Bankers

<i>United Bank Limited (1358)</i>	TPS Colony Branch, Guddu
<i>Habib Bank Limited (0074)</i>	TPS Colony Branch, Guddu
<i>National Bank of Pakistan (2079)</i>	TPS Colony Branch, Guddu

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E) Auditors & Legal Advisor

<i>Auditors</i>	Ernst & Young Ford Rhodes Sidat Hyder & Co. Chartered Accountants
<i>Legal Advisor</i>	Mr. Rizwan Faiz Muhammad

F) Ownership, Share Capital & Shareholders Pattern

The Company is 100% owned by the Government of Pakistan.

The authorized capital of the company is Rs: 50,000,000,000 divided into 5,000,000,000 Ordinary shares of Rs. 10 each. In total 50,000 shares have been issued and out of which one share of Rs. 10 each has been issued to seven directors of the company and 49,993 shares issued to WAPDA and subsequently transferred in the name of President Islamic Republic of Pakistan.

No.	Name	Position	Shares
1.	Mr. Syed Tahir Nawazish	Director / Chairman	1
2.	Mr. Abdul Qayum Malik	Director	1
3.	Mr. Mahfooz Ahmad Bhatti	Director	1
4.	Mr. Pervaiz Iqbal	Director	1
5.	Mr. Muhammad Aslam Shaikh	Director	1
6.	Mr. Sabeeh Uz Zaman Faruqi	Director / CEO	1
7.	President of Pakistan		49,993
		Total Shares	50,000

G) Board of Directors

(171)

No.	Name	Status / Position
1.	Mr. Syed Tahir Nawazish	Director / Chairman
2.	Mr. Abdul Qayum Malik	Director
3.	Mr. Mahfooz Ahmad Bhatti	Director
4.	Mr. Pervaiz Iqbal	Director
5.	Mr. Muhammad Aslam Shaikh	Director
6.	Mr. Sabeeh Uz Zaman Faruqui	Director / CEO

H) Company History & Operations

Central Power Generation Company Limited is a Public Limited Company With its registered Office at WAPDA House Lahore. The Company was incorporated on October 26,1998, got the certificate of Commencement of Business on December 07, 1998 and started Commercial Operation on March 01, 1999.

The principal activities of the Company are to own, operate and maintain three Thermal Power Houses with total installed capacity of 2502.94 MW. These (3) Power Plants are located at Guddu, Quetta and Sukkur. The installed capacity of these individuals power plants as under:

TPS, Guddu	2402	MW
TPS, Quetta	50.94	MW
TPS, Sukkur	50	MW
Total	2502.94	MW

I) Details Of Land

Description	Formation	QTY/AREA	
Land	Power House	250.00 Acre	
	Residential Colony	454.19 Acre	
	Borrow Land	225.00 Acre	
	Air Strip (Case for change of ownership in process)	20.31 Acre	
	TPS Guddu	Power House	7.74 Acre
	TPS Sukkur	Colony	9.88 Acre

J/1

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**Engineering and Technical Staff proposed
to be employed**

Annex - J/1

**LIST OF OPERATION STAFF FOR 800 MW COMBINED CYCLE
POWER PLANT
AT GUDDU**

S.No.	Description	No
1	Resident Engineer	1
2	Assistant Resident Engineer	2
3	Stenographer Grade-I	1
4	Stenographer Grade-II	1
5	Naib Qasid	2
ELECTRICAL SECTION		
6	Senior Engineer	1
7	Junior Engineer	2
8	Foreman Grade-I	2
9	Test Inspector	2
10	Electrician	10
11	Fitter Grade-I	4
12	Armature Winder	1
13	Cable Jointer	1
14	Air Conditioning Fitter	1
15	AC Mechanic	1
16	ASAs	6
MECHANICAL SECTION		
17	Senior Engineer	1
18	Junior Engineer	2
19	Foreman Grade-I	2
20	Fitters	10
21	Scaffolder	1
22	Lubrication Oil Attendant	1
23	Masson	1
24	L.P Welder	1
25	H.P Welder	1
26	Crane Operator	1
27	ASAs	6
28	Coolies	4
INSTRUMENTATION & CONTROL		
29	Senior Engineer	1
30	Junior Engineer	2
31	Foreman Grade-I	2
32	Test Inspector	2
33	Laboratory Assistant	2
34	Fitter Grade-I	4
35	Telephone Mechanic	1
36	ASAs	4

OPERATION SECTION		
37	Senior Engineer	4
38	Junior Engineer	8
39	Foreman	8
40	Operators	32
41	Attendants	32
42	ASAs	16
CHEMICAL SECTION		
43	Senior Chemist	1
44	Junior Chemist	1
45	Assistant Chemist	6
46	Chemical Attendant	6
47	ASA	6
48	Cooli	2
STORE SECTION		
49	Assistant Store manger	1
50	Line Superintendent-II	1
51	Senior Store keeper	1
52	Junior Store Keeper	2
53	Junior Clerk / Typist	1
54	Store helper	2
55	Store Coolies	2
CIVIL SECTION		
56	Senior Engineer	1
57	Junior Engineer (Civil)	1
58	Sub Engineer (Civil)	2
59	Sanitary worker	6
60	Disposal pump Operator	4
61	Sewer man	2
62	Plumber	1
63	Carpenter	1
64	Mali	4
SECURITY STAFF		
65	Security Inspector	5
66	Security Guards	20
67	Fireman (to perform duty in shift)	8
ITR SECTION		
68	Senior Engineer	1
69	Junior Engineer	1
70	Junior Clerk / Typist	1
71	Naib Qasid	1
DRAWING SECTION		
72	Drafts man Grade-A	1
73	Tracer	1
ENVIRONMENT SECTION		
74	Senior Environment Officer	1
75	Stenographer Grade-II	1

76	Junior Environment Officer	1
77	Environment Supervisor	1
78	Naib Qasid	1
TRANSPORT & WORKSHOP SECTION		
79	Junior Engineer	1
80	Foreman	1
81	Tool Attendant	1
82	Turner	1
83	Miller	1
84	LP Welder	1
85	Fabricator	1
86	Carpenter	1
87	ASA's	2
88	Coolies	3
89	Log book Clerk	1
90	Drivers	17

LIST OF EXECUTION STAFF
FOR 800 MW COMBINED CYCLE POWER PLANT
AT GUDDU

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1.	Project Director	BPS-19	01
2.	Steno Grade-I	BPS-15	01
3.	Naib Qasid	BPS-1	01
4.	Drafts Man	BPS-14	01
5.	Tracer	BPS-5	01
6.	Senior Engineer (Mechanical)	BPS-18	01
7.	Junior Engineer (Mechanical)	BPS-17	01
8.	Senior Engineer (Electrical)	BPS-18	01
9.	Junior Engineer (Electrical)	BPS-17	01
10.	Senior Engineer (I&C)	BPS-18	01
11.	Junior Engineer (I&C)	BPS-17	01
12.	Senior Engineer (Civil)	BPS-18	01
13.	Junior Engineer (Civil)	BPS-17	01
14.	Senior Environment Officer	BPS-18	01
15.	Junior Environment Officer	BPS-17	01
16.	Environment Supervisor	BPS-13	01
17.	Assistant Store Manager	BPS-17	01
18.	Line Superintendent-II	BPS-12	01
19.	Senior Store Keeper	BPS-12	01
20.	Junior Store Keeper	BPS-05	01
21.	Assistant Director Admn	BPS-17	01
22.	Office Superintendent	BPS-16	01
23.	Computer Operator	BPS-12	01
24.	Junior Clerk	BPS-5	01
25.	Naib Qasid	BPS-1	02
26.	Assistant Manager Accounts	BPS-17	01
27.	Account Assistant	BPS-11	01
28.	Cashier	BPS-11	01
29.	Computer Operator	BPS-12	01

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30.	Junior Clerk	BPS-5	01
31.	Naib Qasid	BPS-1	01
32.	Security Officer/Fire Fighting Officer	BPS-17	01
33.	Security Guards	BPS-2	12
34.	Sweeper/Sanitary Worker	BPS-1	04
35.	Steno Grade-II	BPS-12	01
36.	Mali	BPS-02	04
37.	Naib Qasid	BPS-1	01
38.	Log book Clerk	BPS-07	01
39.	Drivers	BPS-07	08
	Total		64

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ANNEX-K

TECHNICAL AND FINANCIAL DETAIL OF 747 MW CCPP GUDDU

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**CENTRAL POWER GENERATION COMPANY LTD
(GENCO-II)**



PROFORMA PC-I

**747 MW COMBINED CYCLE POWER PLANT
AT GUDDU**

**PREPARED BY
PLANNING (POWER) NTDC**

August, 2009

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PROJECT DIGEST

1. **Name of the Project** 747 MW Combined Cycle Power Plant at Guddu.
2. **Location of Project** Guddu (Kashmore), Distt. Kashmore
(Attach map where applicable) Sindh Province. (Location of the project is attached at Annex-I)
3. **Authorities responsible for:**
 - I) **Sponsoring** Central Power Generation Co. Ltd. (GENCO-II)
 - II) **Execution** Central Power Generation Co. Ltd. (GENCO-II)
 - III) **Operation & Maintenance** Central Power Generation Co. Ltd. (GENCO-II)
4. **a) Plan Provision**
 - i. If the project is included in the current five year plan, specify actual allocation
The Project is included in the current five year plan. The scheme has been prepared in view of the directive of "Energy Task Force" for replacement of Wapda's old Power Plant at Guddu with state of the art power plant to maximize the benefit of gas.
 - ii. If not included in the current plan how is it now proposed to be accommodated (inter-intrasectoral adjustment in allocation or other resources may be indicated).
The project is proposed to be financed by "Export Credit Agency (ECA) Financing Consortium" as follows:
Chinese Exim Bank:
85% of the cost of Chinese origin equipment.
US Exim Bank:
85% of the cost of US origin equipment.
GENCO-II
15% of EPC cost and local component of the project will be arranged by GENCO-II

iii. If the project is proposed to be financed out of block provision, for a programme, indicate: block provision, amount already committed, amount proposed for this balance available.

Not Applicable

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b) If the Project is not in the plan, what warrants its inclusion in the plan

The scheme for installation of 747 MW Combined Cycle Power Plant at Guddu has been prepared to meet the short fall of generating capability and to avoid the load shedding in the country in future years.

5. Project Objectives

a) Objectives of the Sector

5.1 The main objective of the Power Development Programme is to provide adequate facilities for generation, transmission & distribution of electrical power, keeping in view the future power requirements for domestic, commercial, industrial, agricultural & economic development of the country.

5.2 A number of Hydel & Thermal Power Stations have been installed to meet the power demand of the country. The breakup of existing installed capacity of the integrated WAPDA system, as of April 2009, is given below:

i)	Hydel	6444 MW
ii)	Thermal	4840 MW
iii)	IPPs	6390 MW
iv)	Rental	285 MW
	Total	<u>17959 MW</u>

Category/power station wise detailed breakup of installed capacity of total WAPDA system is given at Annex-II.

5.3 To meet the future requirement of electricity and to cover the power demand-supply gap in the country in coming years, it has been planned to add more thermal power in the system by installation Power Plants in Private Sector (IPPs) and in Public Sector (GENCOs)

b) Objectives of the Project

The main objective of the proposed project is to install a combined cycle power plant of 747 MW capacity comprising of two gas turbines of 261 MW each, 2 HRSGs and one steam turbine unit of 225 MW in the existing site of Thermal Power Station at Guddu where sufficient land and infrastructure is already available.

6 Description and Justification of Project**6.1 Back Ground**

The power complex at Guddu is predominantly based on commingled gas, available from different gas sources with limited optional firing of steam units 3-4 on fuel oil as well. The steam power plant units 1-2 were commissioned in 1974 and hence have outlived their useful life, by way of their operation for more than 32 years. The units with a design capacity of 110 MW each, have permanently de-rated to 75 MW capacity each. The heat rate of the machines has also increased from the design value, resulting in more consumption of the gas. These technical exigencies need the review of the operation of units 1-2 on gas. Similarly the units 3-4, commissioned in 1980 & 1985 respectively, have also de-rated to 140 MW than the design capacity of 210 MW each.

In view of the foregoing, it was contemplated to place high efficiency machines at Guddu for operation by diverting the gas quota of existing steam units. By the time, the proposed subject combined cycle plant would be commissioned; the existing steam units 3-4 would have outlived their useful life as well. Consequently, the installation of a combined cycle plant in the range of 700-800 MW capacity with high efficiency comprising latest state of the art gas turbines, would be more favorable and viable venue. Sufficient land is available at Guddu Power Complex for installation of the proposed plant.

6.2 Project Description

747 MW Gas Turbine Combined Cycle Power Plant has been proposed to be installed at Guddu comprises of two Gas Turbines of 261 MW each, two HRSGs and one steam turbine unit of 225 MW. This plant will operate on gas by diverting gas quota of existing steam units (1-4) of Power Complex at Guddu. It is an efficient plant having efficiency of about 56% and lesser generation cost/kWh including the following advantages:

- The gas turbines are quick start machines and take base load within 15 to 20 minutes.

- The gas turbines are of improved design and have higher efficiency up to 38%.
- The combined cycle efficiency is up to 56%.
- Plant availability factor is significantly higher than the conventional Thermal Power Plants.

6.3 Existing facilities at proposed sites

Existing site of Guddu Thermal Power Station having communication facilities, potable water source and convenient connectivity with National Grid system has been selected for installation of 747 MW combined Cycle Power Plant due to WAPDA's ownership and infrastructure to ensure its economics.

747 MW Gas Turbine Combined Cycle Power Project has been proposed to be installed at existing Thermal Power Station Guddu, which is about 18 Km to the east of the Subdivision Headquarter Kashmir Town on the road leading to Sadiqabad. Thermal Power Station Guddu is situated on right bank of River Indus near Guddu Barrage. Sufficient land for construction of Power Plant is available at the east-south of existing Unit No.4 of the Power Station. Also enough land is available in the existing residential colony for construction of additional housing units. Moreover, land is also available outside boundary of the residential colony for construction of housing units if required.

6.4 Justification of the Project

The increasing trend of power demand results shortfall in generating capability, which causes the load shedding in the country. To bridge the gap between demand and supply, additional power is required to be added in the system. Accordingly the scheme for installation of 747 MW Combined Cycle Power Plant at Guddu has been prepared in view of the following decisions:

During power demand review meeting, held on 14.06.2007, under the chairmanship of Prime Minister of Pakistan, it was directed to put up a proposal for replacement of old power plant installed at Guddu, with state of the art power plants, to maximize the benefits of Gas.

Further, Energy Task Force, in its meeting held on 27th to 31st July 2007, chaired by Deputy Chairman Planning Commission, directed to prepare the PC-I for the project.

18.5

In compliance, a project concept clearance document in respect of 700-800 MW Combined Cycle Power Plant at Guddu was submitted to the Ministry of Water & Power on 23.06.2007, the same was also forwarded by Ministry of Water & Power to Planning Division on 18.09.2007.

6.5 Water Requirement and Availability

The quantity of water required for condenser cooling will be approx 42,000 m³/hour for once through system and other plant requirements. During cooling tower operation, plant will require 1200 m³/hr water for cooling towers as make up. The water will be obtained from the B.S. feeder canal, taking off from the Guddu Barrage. However, during the canal closure period, water will be drawn from the tube wells installed on the bank of the canal. The ground water quality is good for use in plant.

6.6 Fuel Availability

The gas quota of the steam Units No.1-4 of Guddu Thermal Power Complex will be diverted and used on this proposed efficient combined cycle power plant at Guddu having capacity of around 747 MW.

6.7 Annual Plant Factor

Average annual plant factor for the proposed combined cycle power plant has been assumed as 60% per annum in view of energy sharing of existing combined cycle power plants of WAPDA system.

6.8 UNIT COST

The overall project cost has been estimated as Rs. 59775.41 million. The cost/kW works out to Rs. 80000/- (equivalent to US\$ 964).

6.9 Calorific Value and Cost of Fuel

Natural Gas

Calorific value	= 836 BTU/cft
Rate of Natural Gas	= Rs.322.24/MMBTU
<u>Heat Rate & Cost/KWh</u>	
Heat Rate	= 6376 kJ/kWh
	= 6072.38BTU/KWh
Cost of Natural Gas	= Rs.1.96/KWh

6.10 Civil works, equipment, machinery and other physical facilities required for the project

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Sr. No.	Description	Quantity
1	Heavy duty gas turbines	2 No.
2	HRSGs of adequate capacity	2 No.
3	Steam Turbine	1 No.
4	AC Generators for gas turbines	2 No.
5	AC Generators for steam turbines	1 No.
6	Unit transformers	3 No.
7	Auxiliary unit transformers	3 No.
8	Other transformers	1 Lot
9	DCS systems with Plant computers	1 Lot
10	Control and protection panels	1 Lot
11	11 kV/15 kV Power supply systems complete with breakers, controls, protections panels etc.	1 Lot
12	0.4 kV Power supply systems with breakers, controls, protections panels etc.	1 Lot
13	Batteries and rectifiers for DC system complete in all respects.	1 Lot
14	Power and control cables etc.	1 Lot
15	Balance of Plant (BOP) equipment.	1 Lot
16	Switch yard equipments, control and protection panels etc.	1 Lot
17	Demi Water Treatment Plant complete in all respects	1 No.
18.	Diesel (HSD) storage tanks	4 Nos.

6.11 Power Dispersal Arrangements

747 MW Combined Cycle Power Plant will be interconnected with the existing system by construction of two 500 kV single circuit transmission lines (2.5+2.5km) for looping In/Out of existing 500 kV Guddu – Multan S/C at Combined Cycle Power Plant. However, studies are being carried out to assess the transmission lines requirement for dispersal of power to be generated from the above power plant to the load centers.

Note:

Two 500 kV S/C T/Lines (2.5+2.5 km long) for in/out of existing 500 kV Guddu-Multan T/Line at New 500 kV substation of CCPP will be constructed under the present scheme, however, other transmission lines required for dispersal of power (to be ascertained as result of load flow studies) will be constructed separately after obtaining the approval of GoP.

The single line diagram of the power dispersal scheme is attached at Annex-III.

6.12 Governance issues of the sector relevant to the project and strategy to resolve them

There is no major governance issue of the sector in execution of the project.

7. Capital Cost estimates

(Rs. in million)

Local	FEC	Total
14302.66	45472.75	59775.41

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7.1 Indicate date of estimation of project cost Aug, 2009**7.2 Basis of cost estimates**

The cost estimate for plant & equipment and main civil works for the proposed project has been prepared on the basis of Notice of award issued for supply & installation of 747 MW Combined Cycle Power Plant at Guddu. Cost estimate for remaining works & items has been prepared on the basis of present prevailing market prices.

The exchange rates used: 1 US\$ = Rs 83.00

7.3 Year-wise estimation of physical activities

Sr. No.	Year	Physical Activities
1.	1 st Year 2009-10	i) Contract Award ii) Site survey and site preparation iii) Approval of design drawings iv) Manufacturing of equipment & machinery v) Civil works.
2.	2 nd Year 2010-11	i) Shipment of machinery & equipment ii) Erection of machinery & equipment. iii) Civil Works.
3.	3 rd Year 2011-12	i) Testing and commissioning of G.Ts (open cycle). ii) Guarantee & Defect liability period.
4.	4 th Year 2012-13.	i) Testing and commissioning of Combined Cycle Plant (Steam Turbine portion) ii) Guarantee & Defect liability period.

**7.4 YEAR WISE / COMPONENT WISE FINANCIAL PHASING
747 MW COMBINED CYCLE POWER PLANT AT GUDDU**

Sr. No.	Items	Estimated Cost (Rs. in million)				2009-2010			2010-2011			2011-2012			2012-2013		
		Local	FEC	Import Duty	Total	Local	FEC	Total	Local	FEC	Total	Local	FEC	Total	Local	FEC	Total
A- Thermal Power Station																	
(i)	Land for power station and colony	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(ii)	Site preparation and engineering	30.00	0.00	0.00	30.00	6.00	0.00	6.00	10.50	0.00	10.50	10.50	0.00	10.50	3.00	0.00	3.00
(iii)	Spending of fuel ash and cooling water system, waste water system etc	50.00	0.00	0.00	50.00	10.00	0.00	10.00	17.50	0.00	17.50	17.50	0.00	17.50	5.00	0.00	5.00
(iv)	Plant & Equipment 747 MW combined cycle power plant consisting of two gas turbines two HRSGs, one steam turbine unit transformers, auxiliary transformers and other MV/LV transformers and equipments, AG/DC system control equipment/system, demin water treatment plant and spare parts etc	419.88	44429.99	2221.50	47071.38	528.28	8885.98	9414.26	924.48	15550.47	16474.95	924.48	15550.47	16474.95	264.14	4442.99	4707.13
(v)	Mandatory Spares	0	86.57	3.33	90.90	0.67	13.31	13.98	1.16	23.30	24.46	1.16	23.30	24.46	0.33	6.69	6.99
(vi)	Main Civil Works Civil Works & structures including machine hall and other associate buildings, equipment foundations civil works, structures for HRSGs, steam turbo generators, gas turbine generators, ancillary equipments water treatment plant, cable trenches inclusive of cooling water system etc.	3797.60	0.00	0.00	3797.60	759.53	0.00	759.53	1329.18	0.00	1329.18	1329.18	0.00	1329.18	379.77	0.00	379.77
B- Interconnect Transmission Line																	
	500 KV single circuit transmission lines (2.5*2.5 km) for inlet of existing 500 KV Guddu-Multan single circuit at 500 KV substation of 747 MW CCPP Guddu	34.11	84.86	4.23	123.00	7.67	16.93	24.60	13.42	29.63	43.05	13.42	29.63	43.05	3.33	3.47	12.33
Sub-totals (A+B)		4331.65	44511.13	2229.05	51141.84	1312.14	8315.23	10228.37	2296.25	15603.40	17899.64	2296.25	15603.40	17899.64	655.07	4455.11	5114.18

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Sr.No.	Items	Estimated Cost (Rs. in million)				2009-2010			2010-2011			2011-2012			2012-2013		
		Local	FEC	Import Duty	Total	Local	FEC	Total	Local	FEC	Total	Local	FEC	Total	Local	FEC	Total
C- General Items																	
(i)	Residential buildings	101.70	0.00	0.00	101.70	20.34	0.00	20.34	35.60	0.00	35.60	35.60	0.00	35.60	10.17	0.00	10.17
(ii)	Vehicles	11.20	0.00	0.00	11.20	2.24	0.00	2.24	3.92	0.00	3.92	3.92	0.00	3.92	1.12	0.00	1.12
D- Others																	
(i)	Erection charges	Included in equipment cost															
(ii)	Engineering and consultancy @ 0.5% of sub-total (A+B)	32.80	222.91	0.00	255.71	6.56	44.53	51.14	11.48	78.02	89.50	11.48	78.02	89.50	3.28	22.29	25.57
(iii)	Administration and authority overhead @ 0.75% sub-total (A+B)	383.56	0.00	0.00	383.56	75.71	0.00	75.71	134.25	0.00	134.25	134.25	0.00	134.25	38.36	0.00	38.36
(iv)	Contingencies @ 1.5% of sub-total (A+B)	98.41	668.72	0.00	767.13	19.68	133.74	153.43	34.44	231.05	265.49	34.44	234.05	268.49	9.94	65.87	75.81
(v)	Financing Charges @ 2% of sub-total (A-B)	1022.84	0.00	0.00	1022.84	204.57	0.00	204.57	357.99	0.00	357.99	357.99	0.00	357.99	102.28	0.00	102.28
(vi)	Clearing, forwarding, handling and inland transportation	Included in equipment cost															
(vii)	Insurance during construction	Included in equipment cost															
Sub-Total (C+D)		1650.51	891.62	0.00	2542.14	330.10	178.32	508.43	577.68	312.07	889.75	577.68	312.07	889.75	165.05	89.16	254.21
Total (A to D)		5982.17	45472.75	2229.05	53683.97	1642.24	9094.55	10736.79	2873.93	15915.46	18789.39	2873.93	15915.46	18789.39	821.12	4547.28	5368.40
Interest during construction		6091.44	0.00	0.00	6091.44	269.23	0.00	269.23	1026.18	0.00	1026.18	2031.93	0.00	2031.93	2764.10	0.00	2764.10
Grand Total		12073.61	45472.75	2229.05	59775.41	1911.47	9094.55	11006.02	3900.11	15915.46	19815.57	4905.86	15915.46	20821.32	3585.22	4547.28	8132.50

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7.4.1 Land for Power Station and Colony

Sufficient land for construction of Power Plant is available at the east-south of existing Unit No.4 of the Power Station. Also enough land is available in the existing residential colony for construction of additional housing units. Therefore, no provision has been made for purchase of additional land.

7.4.2 Site Preparation and Engineering

An estimated amount of Rs. 30.00 million has been provided for site preparation & engineering, earth filling at site, pitching of canal bank, construction of access road and other temporary facilities required for construction of combined cycle power Plant.

7.4.3 Handling of fuel ash and cooling water supply

An estimated amount of Rs. 50.00 million has been provided for extension in gas supply network including construction of 1 km long 16" dia gas pipeline.

7.4.4 Plant and equipment

An amount of Rs. 47071.28 million with FEC of Rs. 44429.90 million has been provided for main plant & equipment of 747 MW Combined Cycle Power Plant consisting of two gas turbine units, one steam turbine units on the basis of Notice of award as follows:-

Sr. No	Description	Cost		
		Currency	Amount	Eq. Pak Rs. (M)
1-	Equipment cost including erection for Gas Turbines, Steam Turbine, HRSG & all auxiliaries/BOP	FCC US\$	535,300,000	44429.90
		LCC Pak Rs.	419,880,000	419.88
	Provision for Import Duty @ 5% of FCC			2221.50
	Total:			47071.28

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Sr. No.	Description	Amount
	For HRSGs and Steam Turbine Generators:	
1.	Site installation	81,720,384
2.	Civil works of machine hall building including transformers foundations for steam turbine, etc.	222,110,370
3.	Civil works of chemical dosing/chlorination building.	62,916,816
4.	Civil work of water treatment building	7,832,879
5.	Civil works of intake from canal and outfall to river.	189,910,525
6.	Civil works of CW make up water supply pipe line and effluent disposal system.	16,389,560
7.	Civil works of HRSGs	69,369,673
8.	Building services	28,993,521
9.	Roads, paved areas, crash barriers etc.	22,629,838
10.	All other facilities and services required to complete the combined cycle power plant in all respects.	Included
	Sub-total (B)	701,873,566
	Total Item (A+B)	3,797,662,249

7.4.7 Interconnect Transmission Line

An amount of Rs. 123 million including 84.66 million has been provided for construction of 500 kV S/C Interconnect transmission lines (2.5+2.5 km long) for in/out of existing 500 kV Guddu-Multan T/L at New 500 kV substation of combined cycle power plant.

7.4.8 Residential Buildings

An amount of Rs. 101.70 million has been provided for residential buildings to accommodate the essential staff required for operation of power plant as follows:

Sr. No.	Description	Qty	Covered Area (Sq.Ft)	Total Area (Sq. Ft.)	Rate per Sq. Ft	Total (M. Rs)
1.	Category II	5	2500	12500	1500	18.75
2.	Category III	8	1500	12000	1500	18.00

3.	Category IV	20	1000	20000	1500	30.00
4.	Category V	20	600	12000	1500	18.00
Sub total:		53				84.75
Add 20 % for electrification, sanitation and water supply						16.95
Total:						101.70

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7.4.9 Vehicles

An estimated amount of Rs 11.20 Million has been provided for the purchase of following vehicles:

(Rs. in million)

Sr. No.	Description	Qty	Unit Price	Cost
1.	Toyota Corolla Car	1	1.30	1.30
2.	Bus	1	3.50	3.50
3.	Toyota Hiace	2	2.00	4.00
4.	Suzuki Vans	4	0.60	2.40
Total:		8		11.20

7.4.10 Engineering and Consultancy

An amount of Rs 255.71 million including FEC of Rs. 222.91 million has been provided @ 0.5% of the estimated cost of the project for consultancy services.

7.4.11 Administration

An amount of Rs 383.56 million has been provided @ 0.75% of the estimated cost of the project for the administration charges.

7.4.12 Contingencies

An amount of Rs. 767.13 million including foreign exchange component of Rs 668.72 million has been provided @ 1.5% of the estimated cost of the project to meet contingent expenditures.

7.4.13 Financial Charges

An amount of Rs 1022.84 million has been provided for financial charges payable to the donor agencies/banks @ 2% of estimated cost of the project.

7.4.5 Mandatory Spare Parts for Gas Turbines

An amount of Rs.69.90 million including FEC of Rs. 66.57 million has been provided for mandatory spare parts on the basis of Notice of Award Issued for the power plant.

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7.4.6 Main Civil Works

An amount of Rs. 3797.66 million has been provided for main civil works including electro mechanical services and other related services, on the basis of price quoted by the qualified bidder, as follows:

Sr. No.	Description	Amount
A	For Gas Turbine Generators	
1.	Survey works, subsoil investigations, site clearance/demolishing, landscaping etc.	12,935,693
2.	Site Installations	1,501,354,571
3.	Civil works of machine hall building including foundations for G TGs, T/F foundations etc.	316,567,436
4.	Civil works of central control building	352,859,646
5.	Civil works of fuel forwarding system building.	34,860,898
6.	Civil works of fuel storage & handling system (structure & foundations)	13,153,882
7.	Civil works of intake air filter house.	34,465,834
8.	Civil works of exhaust stack	Included
9.	Civil works Black start/emergency diesel engine building	Included
10.	Services buildings (workshop, store, hydrogen generation plant, fire fighting, admin, security etc)	370,484,384
11.	Civil works of switchyard control building structures & foundations.	160,667,319
12.	Civil works of roads, paved areas, crash barriers etc.	156,720,159
13.	One complete drainage and storm water drainage system	84,349,197
14.	One lot of HVAC system	57,369,664
15.	Relocation of existing underground unit No. 4 CCW return pipe/outfall Chanel	Included
16.	All other facilities and services required to complete the power plant in all respects.	Included
	Sub-Total (A)	3,095,788,683

7.4.14 Import Duty

An amount of Rs 2229.05 million has been provided for the import duties/ taxes etc. leviable by the customs on the importation of plant & equipment at an average rate of 5% of C&F cost Plant & Equipment.

7.4.15 Interest During Construction :

An amount of Rs 6091.44 million has been provided for the interest during construction @ 10.65% for Local Component and 3.998% for FEC (on the basis of Libor+2.5%).

B ANNUAL OPERATING COST

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Sr. No.	Description	Cost (Rs. in Million)		
		Local	FEC	Total
a)-	Cost of foreign supplies including raw materials and spares			
i)	C&F Cost	0.00	444.30	444.30
ii)	Duties and taxes	22.21	0.00	22.21
iii)	Landing charges and transportation cost to site	4.44	0.00	4.44
b)-	Cost of local supplies including raw materials and spares	222.15	0.00	222.15
c)-	<u>Cost of fuel</u>			
	Cost of Natural Gas consumption for 3926.23 M kWh to be generated by 747 MW capacity CCPlant at an average Plant Factor of 60%	7826.15	0.00	7826.15
d)-	Labour and establishment)			
e)-	Maintenances)	353.36	0.00	353.36
f)-	Overhead)			
g)-	Other costs (tools and plants))			
h)-	Insurance @ 1 %	597.75	0.00	597.75
i)-	<u>Amortization Charges</u>			
	Amortization on local cost of Rs. 14302.66 million @ 10.65% for 12 years and levelized for 30 years.	855.59	0.00	855.59
	Amortization on F.E.C. cost of Rs. 45472.75 million @ 12% for 12 years and levelized for 30 years. -	1923.13	0.00	1923.13
		11804.79	444.30	12249.09

UNIT COST

i)- Installed Capacity	747.00 MW
ii)- Average Annual Plant Factor	60.00%
iii)- Units Generated	3926.23 MkWh
iv)- Auxiliary Consumption @ 3.48%	136.63 MkWh
v)- Units Available for Sale	3789.60 MkWh
vi)- Annual Recurring Charges	12249.09 Million Rs.
vii)- Cost/kWh Generated	3.12 Rs
viii)- Cost/kWh after Auxiliary Consumption	3.23 Rs

9 Demand and supply analysis

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9.1 Existing capacity of services and its supply/demand

- i) Total Installed capacity. 17959 MW
- ii) Maximum Capability (Summer) 15865 MW
- iii) Maximum Capability (Winter) 11902 MW
- iv) Maximum Demand Recorded (Sep 2008) 14055 MW
- v) Maximum Demand Computed (Sep 2008) 17852 MW

9.2 Projected demand for 10 years

The future loads of all types of categories are calculated on the basis of present pattern of power consumption, taking into consideration industrial and agricultural development programs, future GDP growth and other economic factors. A regression based statistical model has been framed to workout the load forecast. Based on GOP Medium Term Development Framework, the demand forecast upto 2016-17 is as follows:

System Demand Forecast (Excluding KESC)

Year	Demand (MW)	Growth Rate (%)
2008-09	17896	7.50%
2009-10	19352	8.30%
2010-11	20874	8.90%
2011-12	22460	9.00%
2012-13	24126	9.80%
2013-14	25919	9.60%
2014-15	28029	8.60%
2015-16	30223	8.20%
2016-17	32504	7.50%
2017-18	34918	7.20%
Average Growth Rate		7.80%

10. Financial Plan

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Sr. No.	Source	Amount (Rs. in Million)
a)	<u>Equity</u>	
	i) Sponsors own fund.	-
	ii) Federal Govt.	-
	iii) Provincial Govt.	-
	iv) DFI's/banks.	-
	v) General Public.	-
	vi) Foreign equity.	-
	vii) NGO's/beneficiaries.	-
	viii) Others.	-
b)	<u>Debt.</u>	
	i) Local	14302.66
	ii) FEC	45472.75
	iii) Total	59775.41
	iii) Interest Rate	
	Local	10.65% per annum
	FEC	3.998% per annum
	iv) Grace period	-
	v) Repayment period	10 Years
	vi) Loan repayment schedule	Not yet committed
d)	<u>Grants</u>	-
e)	<u>Weighted cost of capital.</u>	-

Benefits of the Project and Analysis
747-MW Power Plant at Gudlu(CO)

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11.1.1 Financial & Economic Analysis

Following assumptions have been used for Financial & Economic Analysis of the project:-

- (i) The analysis is based on constant values, i.e. Costs/O&M expenses have been kept constant during the project's useful economic life. Variations in power/energy costs, addition of taxes/duties etc. imposed by the Government will be treated as pass through items.
- (ii) 3.998% interest rate for foreign cost component and 10.65% for local cost component has been taken into consideration.
- (iii) For estimating the future stream of revenues, the levelized Capacity & Energy charges have been computed and worked out as under:-

Capacity Charge (Rs/kW/month)	886.12
Variable Charge (Rs/kWh)	2.217 (Fuel+VoM)

- ▶ For tariff working, Dbt:Equity ratio of 85:15 has been assumed.
- ▶ Debt repayment period of 12-years has been assumed.

- (iv) The annual recurring charges have been kept constant during the project's useful economic life assumes as 30 years.
- (v) Fuel/Gas price of Rs 322.63/mmbtu has been used. Other Parameters used are:-

Gross Capacity (MW)	747.00
Plant factor	60.0%
Plant Efficiency	56.189%
Auxiliary use	3.48%

- (vi) Capacity and energy charges worked out are on net capacity & energy basis.
- (vii) Based on above, the Financial and Economic analysis have been carried out and detailed calculations are given on the following pages as under:

- a. Financial Analysis Table-I
- b. Economic Analysis Table-II
- c. Sensitivity Analysis Table-III
- d. Profit & Loss Analysis and Cash Flow Statement Table-IV

11-IV

PROFIT AND LOSS & CASH FLOW STATEMENT
GUDDU-747 MW CC- (Gas)

(Rs. in Million)

Year	Income	Interest			FoM+Vo M Cost	Deprecl- ation	Total Expendi- ture	Profit(+) Loss(-)
		Local	F.E.C.	Total				
2012	1339.02	1506.89	1788.12	3295.01	148.19	1793.28	5236.48	-3897.45
2013	16068.30	1437.76	1666.18	3103.94	1778.29	1793.28	6675.51	9392.79
2014	16068.30	1361.08	1539.32	2900.40	1778.29	1793.28	6471.96	9596.33
2015	16068.30	1276.00	1407.34	2683.34	1778.29	1793.28	6254.91	9813.39
2016	16068.30	1181.63	1270.03	2451.66	1778.29	1793.28	6023.23	10045.07
2017	16068.30	1076.94	1127.17	2204.11	1778.29	1793.28	5775.68	10292.62
2018	16068.30	960.80	978.55	1939.35	1778.29	1793.28	5510.92	10557.38
2019	16068.30	831.96	823.93	1655.89	1778.29	1793.28	5227.45	10840.84
2020	16068.30	689.04	663.06	1352.10	1778.29	1793.28	4923.66	11144.64
2021	16068.30	530.49	495.69	1026.18	1778.29	1793.28	4597.75	11470.55
2022	16068.30	354.61	365.97	720.57	1778.29	1793.28	4292.14	11776.16
2023	16068.30	159.49	186.60	346.10	1778.29	1793.28	3917.66	12150.64
2024	16068.30	0.00	0.00	0.00	1778.29	1793.28	3571.57	12496.73
2025	16068.30	0.00	0.00	0.00	1778.29	1793.28	3571.57	12496.73
2026	16068.30	0.00	0.00	0.00	1778.29	1793.28	3571.57	12496.73
2027	16068.30				1778.29	1793.28	3571.57	12496.73
2028	16068.30				1778.29	1793.28	3571.57	12496.73
2029	16068.30				1778.29	1793.28	3571.57	12496.73
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2036	16068.30				1778.29	1793.28	3571.57	12496.73
2037	16068.30				1778.29	1793.28	3571.57	12496.73
2038	16068.30				1778.29	1793.28	3571.57	12496.73
2039	16068.30				1778.29	1793.28	3571.57	12496.73
2040	16068.30				1778.29	1793.28	3571.57	12496.73
2041	16068.30				1778.29	1793.28	3571.57	12496.73
Salvage	5977.59	0.00	0.00	0.00	0.00	0.00	0.00	5977.59
Total	473297.27	11366.70	12311.96	23678.66	51718.53	53798.34	129195.53	344101.74

Total Cost:	59775.93
Total Cost net of Sal.Val	53798.34
Depreciation ovr 30 Years	1793.28

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11.2 Social Benefits

The power demand in the country is continuously rising due to increased momentum of economic activities in the agricultural sector and establishment of manufacturing units. The fast urbanization has also increased the demand for electricity in the households. The households are using a greater number of electrical gadgets and appliances than ever before vis-à-vis increase in standard of living – an indicator of economic well being resulting from higher per capita disposable income.

The increased quantum of electricity will be used for farm mechanization. The much needed requirements for tube wells electrification will be adequately met which will not only provide additional water for irrigation but as well as reduce the ground water reservoir level. The reclamation of land will increase the cropped areas and also production. The availability of motive power will provide incentive for the establishment of industries based on local raw materials, creating gainful employment opportunities to the increasing work force. This is envisaged to considerably alleviate disguised unemployment on the farms. The providing of a basic infrastructure facility of electricity in rural areas will go a long way to check large scale migration of rural labor force to urban centers. The requirements of power demand for accelerated villages/ rural electrification program will also be adequately met. In the overall analysis, the improvement in ecological environments coupled with higher production is envisaged to bring about substantial economic gains for the people living in the project area.

The increased agro-based industry etc. will bring additional revenues to provincial exchequer from the levy of taxes on agricultural and finished goods. The revenue of provincial government will also increase from electricity duty due to additional sale of power. Besides, the annual payment of interest charges to the national exchequer is a perpetual benefit.

11.3 Environmental Effect of the Project:

The burning of fossil fuels in power plant produces emissions. These emissions consist of Sulfur dioxide (SO₂), Nitrogen Oxides (NO_x), Carbon Dioxide (CO₂) & CO, Particulate Matters and Volatile Organic Compounds. M/s. KBN Engineering and applied science Inc. (KBN) under sub-contract to M/s. Gibbs & Hill Inc. prepared the Environmental and Social Soundness

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report for the existing plant which comprises of 2x110 & 2x210 MW steam units and one combined cycle of 500 MW and one 415 MW CCP. The emissions from the existing plants are less than the World Bank Guidelines on both fuels i.e. gas and oil. The emissions of SO₂ from all the steam units are 200 tons/day on furnace oil during gas shortage and were well within the Pakistan/World Bank Standards of 500 tons/day. The NO_x emissions from steam units remains around 123 mg/Nm³ on actual monitoring against the World Bank Standards of 400 mg/Nm³ and are within the limits, there are no standards for CO₂ and volatile organic compounds and these are controlled through good combustion practice.

The addition of the 747 MW Combined Cycle Power Plant will not change the quantity of the SO_x emissions as the plant will be operated on Natural Gas and gas do not contain sulphur. However, by applying Low NO_x burners during the gas firing NO_x emissions would be 30 mg/Nm³ against the World Bank Standards of 51 mg/Nm³. There will be no adverse impact on the environment by addition of 747 MW combined cycle power plant due to the use of gas.

11.3.1 Ambient Air Quality

The ambient air quality in the area comes under the unpolluted category. The gas is mostly used in the existing units and due to use of gas, emissions are very low. The ambient concentration predicted by using air dispersion model on furnace oil and gas remains well within the World Bank limits. The emission from the additional power plant will not change the ambient air level as the plant will operate on natural gas. The predicted values for the existing plant are as under:-

Parameters	Predicted Values Annual Average ug/m ³	Applicable World Bank Standards
Natural Gas		
SO ₂	4	80
NO _x	12	100
Oil		
SO ₂	54	80
NO _x	15	100
PM		
Annual Average ug/m ³	200*	80
Annual Increment ug/m ³	3.8**	-

*Background Concentration

**Annual Average Concentration due to power plant

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11.3.2 Solid Waste

The solid waste produced from the power plant and the colony area are collected and disposed off properly in a designated area within the plant boundary and there is no effect of its disposal on the environment. The plant will not produce any solid waste due to use of Natural Gas, however other solid waste produced from the power plant site like garbage, will be collected at the disposal point in the area. This solid waste will be transported to a landfill site selected outside the project area.

11.3.3 Noise Pollution

Noise in the plant is measured regularly and necessary measures are taken to reduce the noise pollution. In most of the areas of plant the noise level is well below the standards of 85 dB (A). Workers working in the area with high noise level are provided with ear protection devices in order to reduce the effect of the noise. However, ambient noise level outside the boundary wall are well below the World Bank Standards of 55 dB (A) and 45 dB (A) respectively in the day and night time.

11.3.4 Water Requirement and Resources

The quantity of water required for condenser cooling will be approx 42,000 m³/hour for once through system and other plant requirements. During cooling water operation, plant will require 1200 m³/hr water for cooling towers as make up. The water will be obtained from the B.S. feeder canal, taking off from the Guddu Barrage. However during the canal closure period, water will be drawn from the tube wells installed on the bank of the canal. The ground water quality is good for use in plant.

11.3.5 Liquid Waste

Major sources of waste water from the plant are condenser cooling, boiler blow down, cooling tower blow down, Chem. Laboratory and sampling drains, additional sanitary waste, water from water treatment facilities and other low volume wastes include floor drains, softener regeneration brines filter backwash. Wastewater is disposed off in the Indus River after proper treatment by sedimentation, neutralization, flow equalization and mixing and dilution. This treatment considerably reduces the pollution load to meet National environmental quality standards.

12. Commissioning Schedule

Gas Turbines (Unit 1)

29 Months effective from date of the contract award.

Gas Turbines (Unit 2)

30 Months effective from date of the contract award.

Steam Turbine:

36 Months effective from date of the contract award.

The implementation schedule is shown as Annex-IV.

13. Management Structure and Manpower Requirements.

Sr. No.	Description	For Execution		For Operation
		No.	Month	No.
1.	Professional & Technical	5	26	30
2.	Administrative, Executive and Managerial	5	26	8
3.	Clerical	7	26	10
4.	Services	-	-	18
5.	Skilled	27	26	158
6.	Unskilled	20	26	65
7.	Others	-	-	27
	Total:	64		316

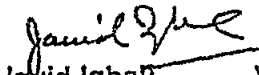
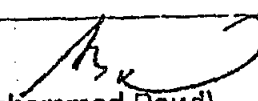
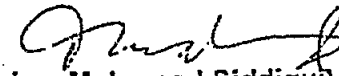
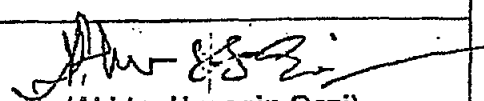
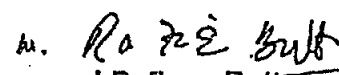

Detail of the staff required for execution & operation is given at Annex-V & VI respectively.

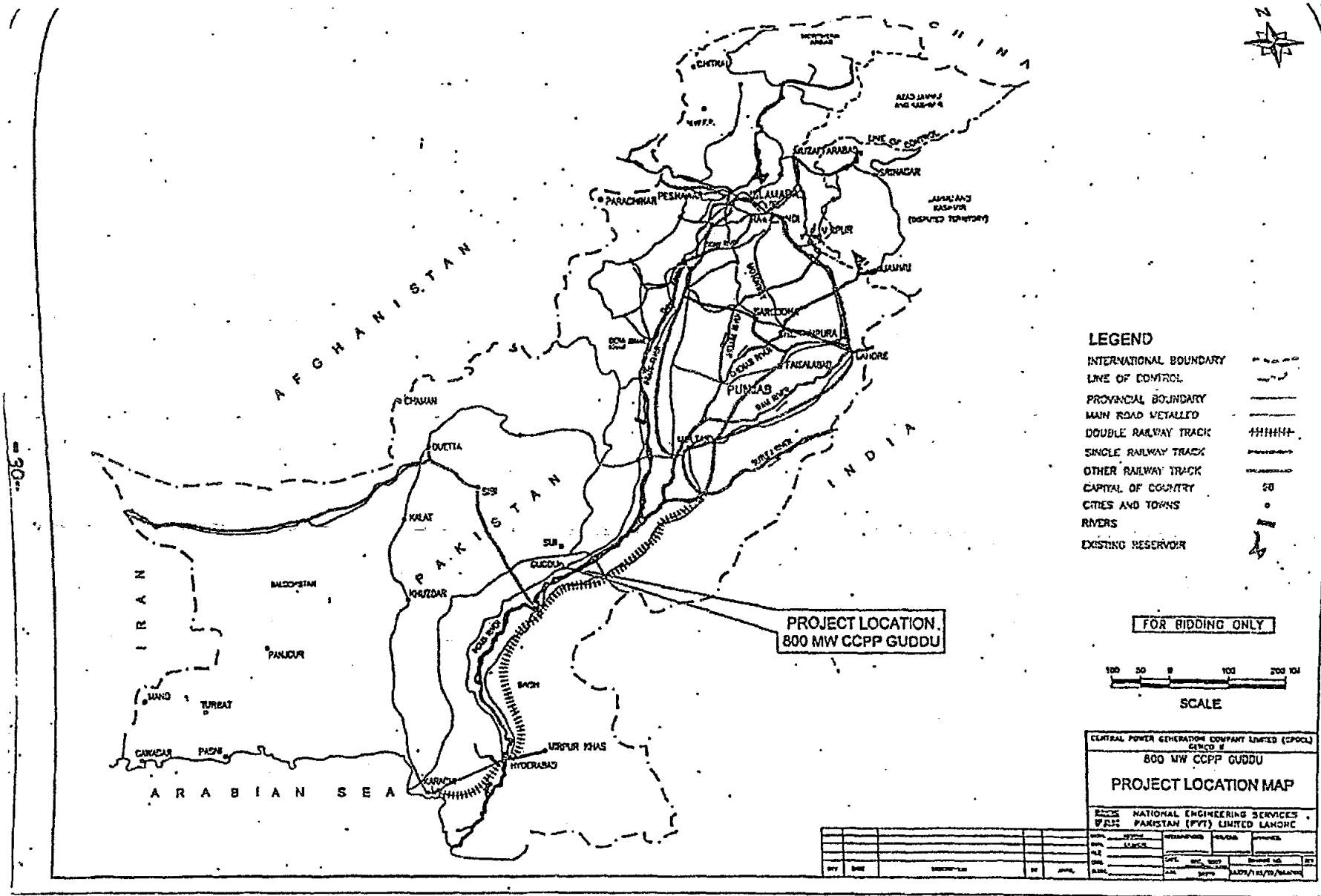
14. Additional projects/decisions required

Approval of competent forum is required to undertake the execution of the proposed scheme to meet the urgent requirement of the system.

15. Certificate

Certified that the project proposal for "Installation of 747 MW Combined Cycle Power Plant at Guddu" has been prepared on the basis of guidelines provided by the Planning Commission for preparation of PC-I.

Prepared by:	 (Javid Iqbal) Chief Engineer Projects Planning
Reviewed by:	 (Muhammad Daud) General Manager Planning (Power)
Checked by:	 (Qaisar Mahmood Siddiqui) Director (D&C) Thermal
Recommended by:	 (Akhtar Hussain Qazi) Project Director CCPP Guddu
Approved by:	 Muhammad Rafique Butt Chief Executive Officer (GENCO-II)
Forwarded to Planning Commission by:	 Secretary Ministry of Water & Power Govt. of Pakistan, Islamabad



Annex: I

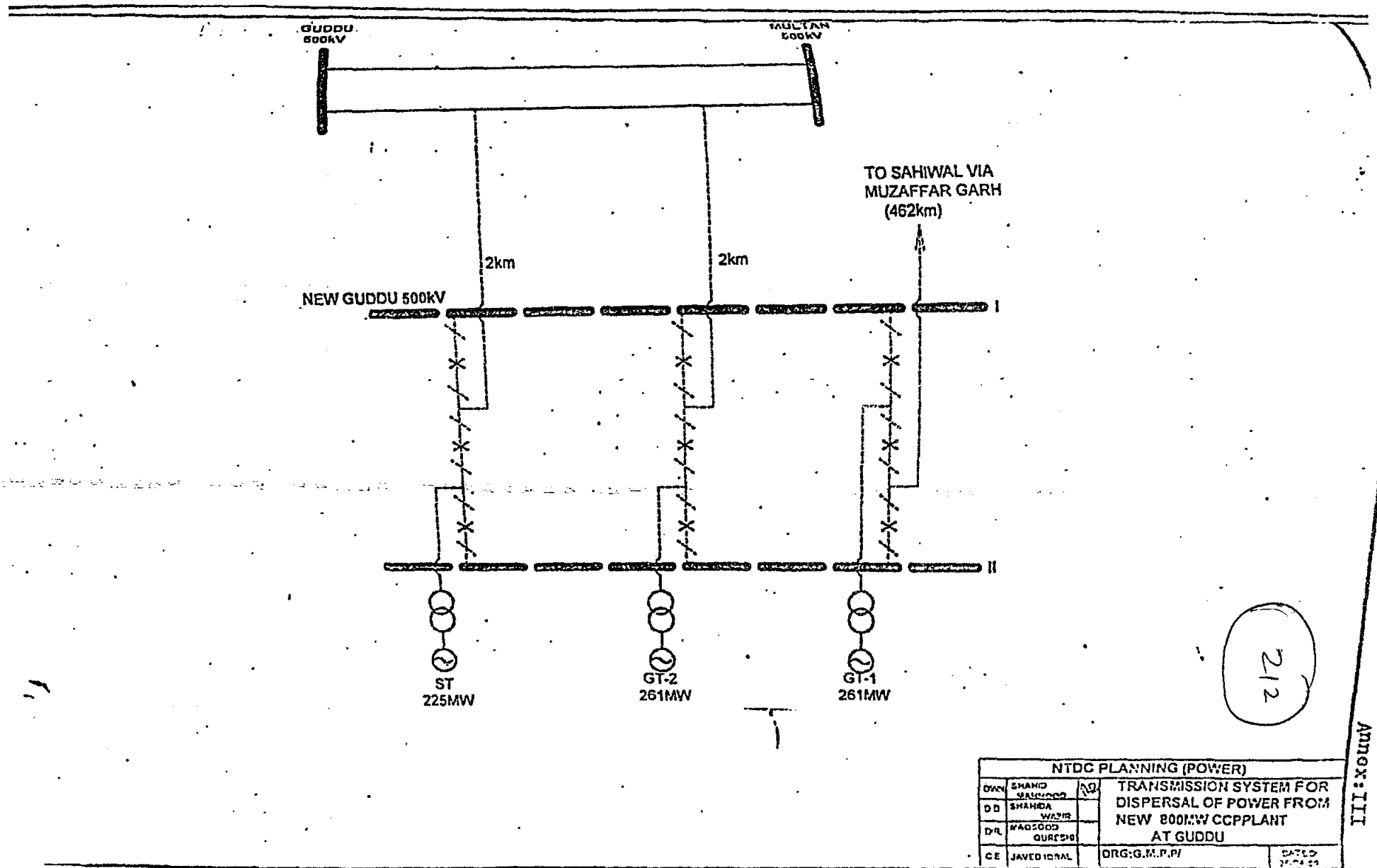
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Installed Capacity & Capability of WAPDA System
As of April 2009

(211)

Sr. No.	Name of Power Station	Installed Capacity (MW)	Capability* (MW)	
			Summer	Winter
HYDRO:				
1	Tarbela	3478	3521	1191
2	Mangla	1000	1014	409
3	Ghazi Barotha	1450	1405	580
4	Warsak	243	171	145
5	Chashma Low Head	184	91	48
6	Small Hydels	89	64	20
	Sub-Total (Hydel)	6444	6266	2303
GENCOs		Installed Capacity	Derated Capacity	
GENCO-I:				
7	TPS Jamshoro #1-4	850	700	
8	GTPS Kotri #1-7	174	140	
9	FBC Lakhra	150	30	
10	TPS Quetta	35	25	
	Sub-Total GENCO-I	1209	895	
GENCO-II:				
11	TPS Guddu Steam #1-4	640	270	
12	TPS Guddu C.C. #5-13	1015	885	
	Sub-Total GENCO-II	1655	1155	
GENCO-III:				
13	TPS Muzaffargarh #1-6	1350	1130	
14	NGPS Multan #1&2	195	60	
15	GTPS Faisalabad #1-9	244	210	
16	SPS Faisalabad #1&2	132	100	
17	Shahdra G.T.	55	30	
	Sub-Total GENCO-III	1976	1530	
	Total GENCOs	4840	3580	
Total Capacity (Hydel+GENCOs)		11284	9846	5883
IPPs		Installed Capacity	Dependable Capacity	
18	KAPCO	1638	1386	
19	Hub Power Project (HUBCO)	1292	1200	
20	Kohinoor Energy Ltd. (KEL)	131	124	
21	AES Lalpir Ltd.	362	350	
22	AES Pak Gen (Pvt) Ltd.	365	350	
23	Southern Electric Power Co. Ltd. (SEPCOL)	135	119	
24	Habibullah Energy Ltd. (HCPC)	140	129	
25	Uch Power Project	586	551	
26	Rouch (Pak) Power Ltd.	450	395	
27	Fauji Kabinwala (FKPCL)	157	151	
28	Saba Power Company	134	125	
29	Japan Power Generation Ltd.	135	120	
30	Liberty Power Project	235	211	
31	Chashma Nuclear (PAEC)	325	300	
32	Jagran Hydel	30	30	
33	Altern Energy Ltd. (AEL)	31	31	
34	Malakand-III	81	27	
35	Attock Generation PP	163	156	
	Sub-Total (IPPs)	6390	5755	
RENTAL		Installed Capacity	Dependable Capacity	
36	GE Power at Lahore	150	150	
37	ALSTOM Power at Bhikki	135	114	
	Sub-Total (RENTAL)	285	264	
Total Thermal		11515	9599	
Total (WAPDA System)		17959	15865	11902

* Hydro Capability based on 5 years average



NTDC PLANNING (POWER)			
OWN	SHAHID	AD	TRANSMISSION SYSTEM FOR DISPERSAL OF POWER FROM NEW 800MW CCPLANT AT GUDDU
DD	SHAHIDA		
DR	WAJIB		
	WAQOOD QURSIQ		
CE	JAVED IGHAL	DRG:G.M.P./I	DATED 27.04.20

Annex: III

IMPLEMENTATION SCHEDULE FOR 747 MW COMBINED CYCLE POWER PLANT AT GUDDU

Sr. No.	Description	2009-10					2010-11					2011-12					2012-13																		
		J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A
1-	Award of contract																																		
2-	Advance payment																																		
3-	Civil works																																		
4	Manufacturing and shipment of equipment																																		
5	Installation and erection																																		
6	Testing and commissioning																																		
	GT-1																																		
	GT-2																																		
	Steam Turbine																																		

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Annex IV

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**LIST OF OPERATION STAFF FOR 800 MW COMBINED CYCLE
POWER PLANT
AT GUDDU**

S.No.	Description	No
1	Resident Engineer	1
2	Assistant Resident Engineer	2
3	Stenographer Grade-I	1
4	Stenographer Grade-II	1
5	Naib Qasid	2
ELECTRICAL SECTION		
6	Senior Engineer	1
7	Junior Engineer	2
8	Foreman Grade-I	2
9	Test Inspector	2
10	Electrician	10
11	Fitter Grade-I	4
12	Armature Winder	1
13	Cable Joiner	1
14	Air Conditioning Fitter	1
15	AC Mechanic	1
16	ASAs	6
MECHANICAL SECTION		
17	Senior Engineer	1
18	Junior Engineer	2
19	Foreman Grade-I	2
20	Fitters	10
21	Scaffolder	1
22	Lubrication Oil Attendant	1
23	Masson	1
24	L.P Welder	1
25	H.P Welder	1
26	Crane Operator	1
27	ASAs	6
28	Coolies	4
INSTRUMENTATION & CONTROL		
29	Senior Engineer	1
30	Junior Engineer	2
31	Foreman Grade-I	2
32	Test Inspector	2
33	Laboratory Assistant	2
34	Fitter Grade-I	4
35	Telephone Mechanic	1
36	ASAs	4

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OPERATION SECTION		
37	Senior Engineer	4
38	Junior Engineer	8
39	Foreman	8
40	Operators	32
41	Attendants	32
42	ASAs	16
CHEMICAL SECTION		
43	Senior Chemist	1
44	Junior Chemist	1
45	Assistant Chemist	6
46	Chemical Attendant	6
47	ASA	6
48	Cooli	2
STORE SECTION		
49	Assistant Store manger	1
50	Line Superintendent-II	1
51	Senior Store keeper	1
52	Junior Store Keeper	2
53	Junior Clerk / Typist	1
54	Store helper	2
55	Store Coolies	2
CIVIL SECTION		
56	Senior Engineer	1
57	Junior Engineer (Civil)	1
58	Sub Engineer (Civil)	2
59	Sanitary worker	6
60	Disposal pump Operator	4
61	Sewer man	2
62	Plumber	1
63	Carpenter	1
64	Mali	4
SECURITY STAFF		
65	Security Inspector	5
66	Security Guards	20
67	Fireman (to perform duty in shift)	8
ITR SECTION		
68	Senior Engineer	1
69	Junior Engineer	1
70	Junior Clerk / Typist	1
71	Naib Qasid	1
DRAWING SECTION		
72	Drafts man Grade-A	1
73	Tracer	1
ENVIRONMENT SECTION		
74	Senior Environment Officer	1
75	Stenographer Grade-II	1

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76	Junior Environment Officer	1
77	Environment Supervisor	1
78	Naib Qasid	1
TRANSPORT & WORKSHOP SECTION		
79	Junior Engineer	1
80	Foreman	1
81	Tool Attendant	1
82	Turner	1
83	Miller	1
84	LP Welder	1
85	Fabricator	1
86	Carpenter	1
87	ASA's	2
88	Coolies	3
89	Log book Clerk	1
90	Drivers	17

LIST OF EXECUTION STAFF
FOR 800 MW COMBINED CYCLE POWER PLANT
AT GUDDU

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1.	Project Director	BPS-19	01
2.	Steno Grade-I	BPS-15	01
3.	Naib Qasid	BPS-I	01
4.	Drafts Man	BPS-14	01
5.	Tracer	BPS-5	01
6.	Senior Engineer (Mechanical)	BPS-18	01
7.	Junior Engineer (Mechanical)	BPS-17	01
8.	Senior Engineer (Electrical)	BPS-18	01
9.	Junior Engineer (Electrical)	BPS-17	01
10.	Senior Engineer (I&C)	BPS-18	01
11.	Junior Engineer (I&C)	BPS-17	01
12.	Senior Engineer (Civil)	BPS-18	01
13.	Junior Engineer (Civil)	BPS-17	01
14.	Senior Environment Officer	BPS-18	01
15.	Junior Environment Officer	BPS-17	01
16.	Environment Supervisor	BPS-13	01
17.	Assistant Store Manager	BPS-17	01
18.	Line Superintendent-II	BPS-12	01
19.	Senior Store Keeper	BPS-12	01
20.	Junior Store Keeper	BPS-05	01
21.	Assistant Director Admn	BPS-17	01
22.	Office Superintendent	BPS-16	01
23.	Computer Operator	BPS-12	01
24.	Junior Clerk	BPS-5	01
25.	Naib Qasid	BPS-1	02
26.	Assistant Manager Accounts	BPS-17	01
27.	Account Assistant	BPS-11	01
28.	Cashier	BPS-11	01
29.	Computer Operator	BPS-12	01

218

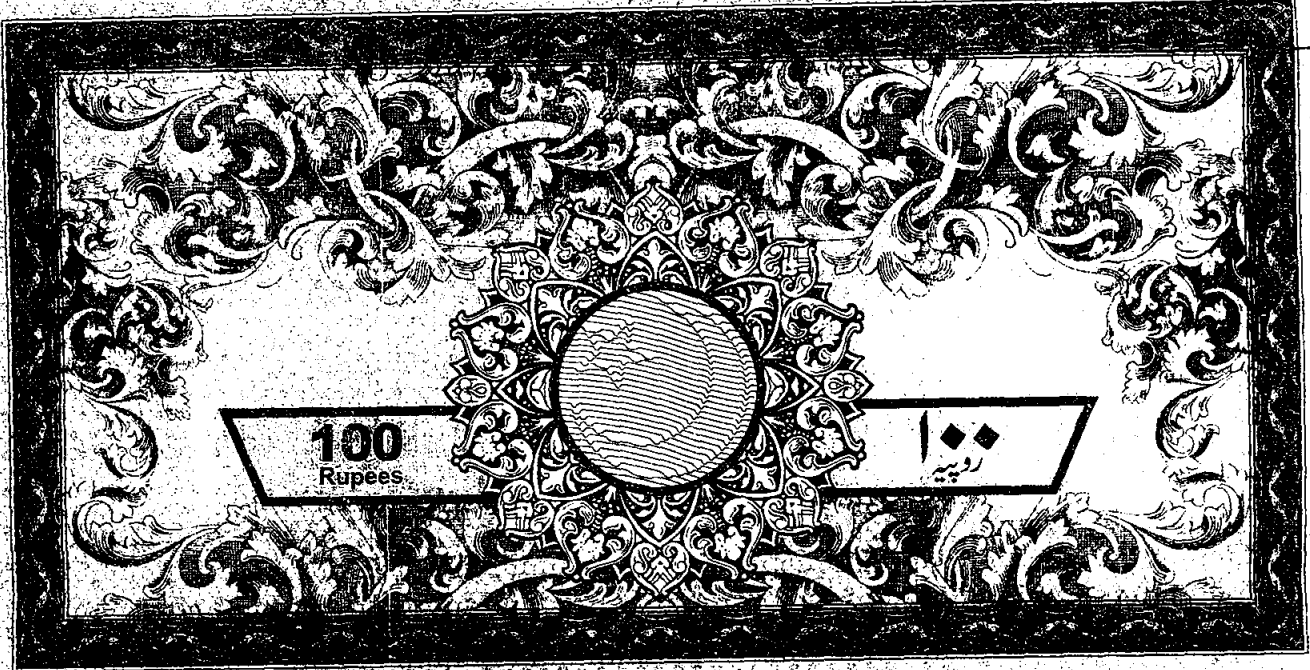
30.	Junior Clerk	BPS-5	01
31.	Naib Qasid	BPS-1	01
32.	Security Officer/Fire Fighting Officer	BPS-17	01
33.	Security Guards	BPS-2	12
34.	Sweeper/Sanitary Worker	BPS-1	04
35.	Steno Grade-II	BPS-12	01
36.	Mali	BPS-02	04
37.	Naib Qasid	BPS-1	01
38.	Log book Clerk	BPS-07	01
39.	Drivers	BPS-07	08

Total

64

ANNEX-L

**AN AFFIDAVIT STATING WHETHER THE APPLICANT HAS BEEN
GRANTED ANY OTHER LICENSE UNDER THE ACT**



Sr # 219 Dt: 10-02-2023 Issued to Mr. Sabeeh Uz Zaman Faruqui S/o Saeed Uz Zaman Faruqui R/o @ Present WAPDA Colony T.P.S Guddu Taluka & District Kashmore CNIC # 35201-7557263-7

CHUDLA, DISTRICT KASHMIRE
Stamp No. 10/02/23
District Kashmore

BEFORE THE NATIONAL ELECTRIC POWER REGULATORY AUTHORITY

Petition by the Central Power Generation Company Limited (GENCO-II) for Grant of a Separate Generation License for the 747 MW Combined-Cycle Power Plant at Guddu under section 14B of the Regulation of Generation Transmission & Distribution of Electric Power Act, 1997 read with Regulation 3 of the National Electric Power Regulatory Authority Licensing (Application Modification, Extension, and Cancellation) Procedure Regulations, 2021,

AFFIDAVIT

I, Sabeeh Uz Zaman Faruqui, adult Muslim made, Chief Executive Officer and Authorised Representative of the Petitioner Company do hereby state on solemn affirmation that no license under the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 has been granted separately for the 747 MW Combined Cycle Power Plant Guddu.


Deponent

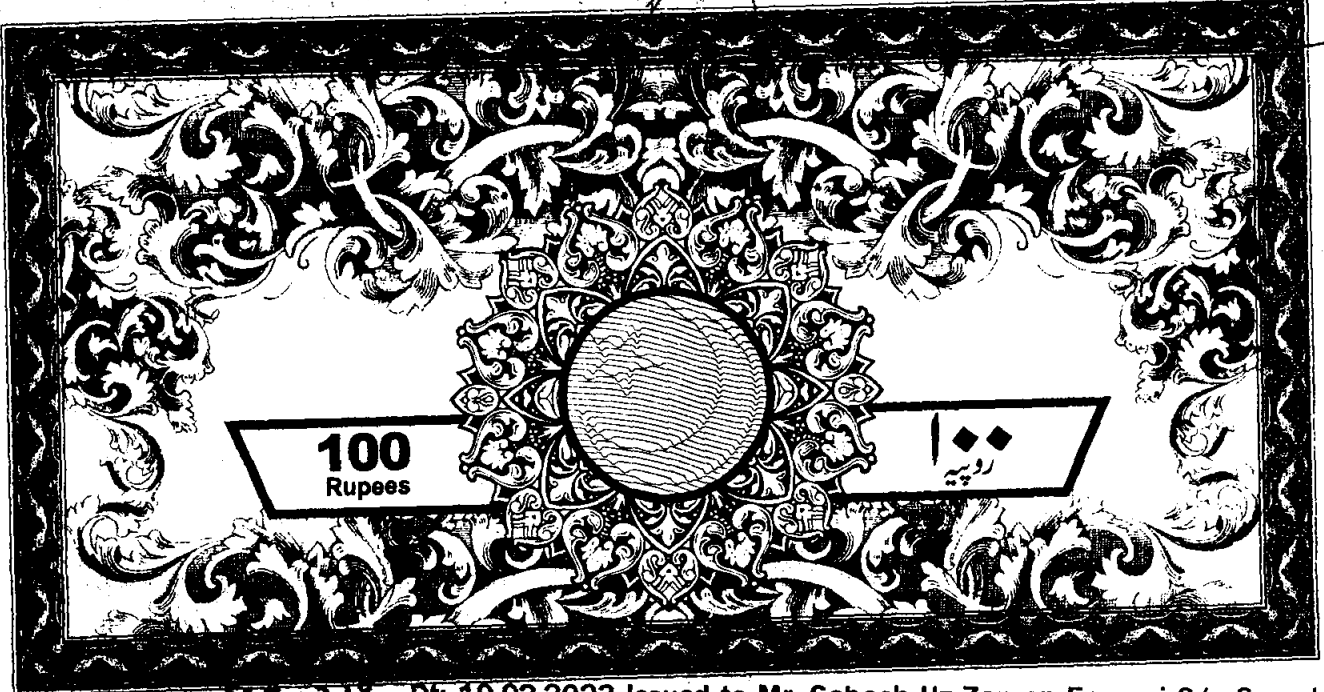
Verified on oath on this _____ day of February 2023 that the contents of this Affidavit are true and correct to the best of my knowledge and belief and nothing has been concealed.


Deponent

221

ANNEX-M

**STATEMENT/AFFIDAVIT REGARDING THE REFUSAL OF LICENSE
UNDER THE ACT**



Sr # 218 Dt: 10-02-2023 Issued to Mr. Sabeeh Uz Zaman Faruqui S/o Saeed Uz Zaman Faruqui R/o @ Present WAPDA Colony T.P.S Guddu Taluka & District Kashmore CNIC # 35201-7557263-7


SHILA CHATTERJEE
Stamp Vendor Kashmore
District Kashmore
10/02/23

BEFORE THE NATIONAL ELECTRIC POWER REGULATORY AUTHORITY

Petition by the Central Power Generation Company Limited (GENCO-II) for Grant of Separate Generation License for the 747 MW Combined-Cycle Power Plant at Guddu under section 14B of the Regulation of Generation Transmission & distribution of Electric Power Act, 1997 read with Regulation 3 of the National Electric Power Regulatory Authority Licensing (Application Modification, Extension, and Cancellation) Procedure Regulations, 2021,

AFFIDAVIT

I, Sabeeh Uz Zaman Faruqui, adult Muslim made, Chief Executive Officer and Authorised Representative of the Petitioner Company do hereby state on the solemn affirmation that the grant of a generation license under the Regulation of Generation, Transmission, and Distribution of Electric Power Act, 1997 for the 747 MW Combined Cycle Power Plant Guddu has not been refused by NEPRA.


Deponent

Verified on oath on this ____ day of February 2023 that the contents of this Affidavit are true and correct to the best of my knowledge and belief and nothing has been concealed.


Deponent

ANNEX-N

BOARD RESOLUTION

224



**CENTRAL POWER GENERATION COMPANY LIMITED
(GENCO-II)**

☎ 0722 – 691050
☎ 0722 – 679085
✉ saadgenco2@yahoo.com

COMPANY SECRETARY

No. CPGCL/CS/BoD/DMoM/134/475

Date: 08.02.2022

**EXTRACT OF MINUTES OF 134TH BOD MEETING
HELD ON FEBRUARY 03, 2022 AT ISLAMABAD**

- AGENDA ITEM NO. 6** TO CONSIDER & APPROVE TO AUTHORIZE CHIEF EXECUTIVE OFFICER CPGCL:
- 1) TO FILE A PETITION FOR MODIFICATION OF CPGCL'S EXISTING LICENSE TO EXCLUDE 747MW CCPP FROM CPGCL'S EXISTING GENERATION LICENSE.
 - 2) TO FILE THE PETITION FOR SEPARATE GENERATION LICENSE OF 747MW CCPP BEFORE NEPRA.

The Board of Directors CPGCL (GENCO-II) has considered the subject matter in its 134th meeting held on February 03, 2022 at Islamabad. After consideration, the Board resolved as under:

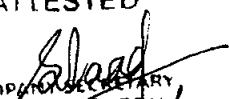
“RESOLVED THAT Chief Executive Officer be & is hereby authorized to file applications before National Electric Power Regulatory Authority (NEPRA) for Licensee Proposed Modification (LPM) to exclude the 747MW Combined Cycle Power Plant, Guddu from Generation License No. GL/02/2002 and to issue a new separate Generation License for this Block and to sign all necessary documents and perform all necessary acts in this regard.

FURTHER RESOLVED THAT Chief Executive Officer be & is hereby authorized to pay filing fee of Rs. 1,633,434/- for each application to NEPRA.”

Detailed discussion is contained in the draft minutes, which are subject to confirmation in next Board Meeting.

This is for information, record and necessary action, please.

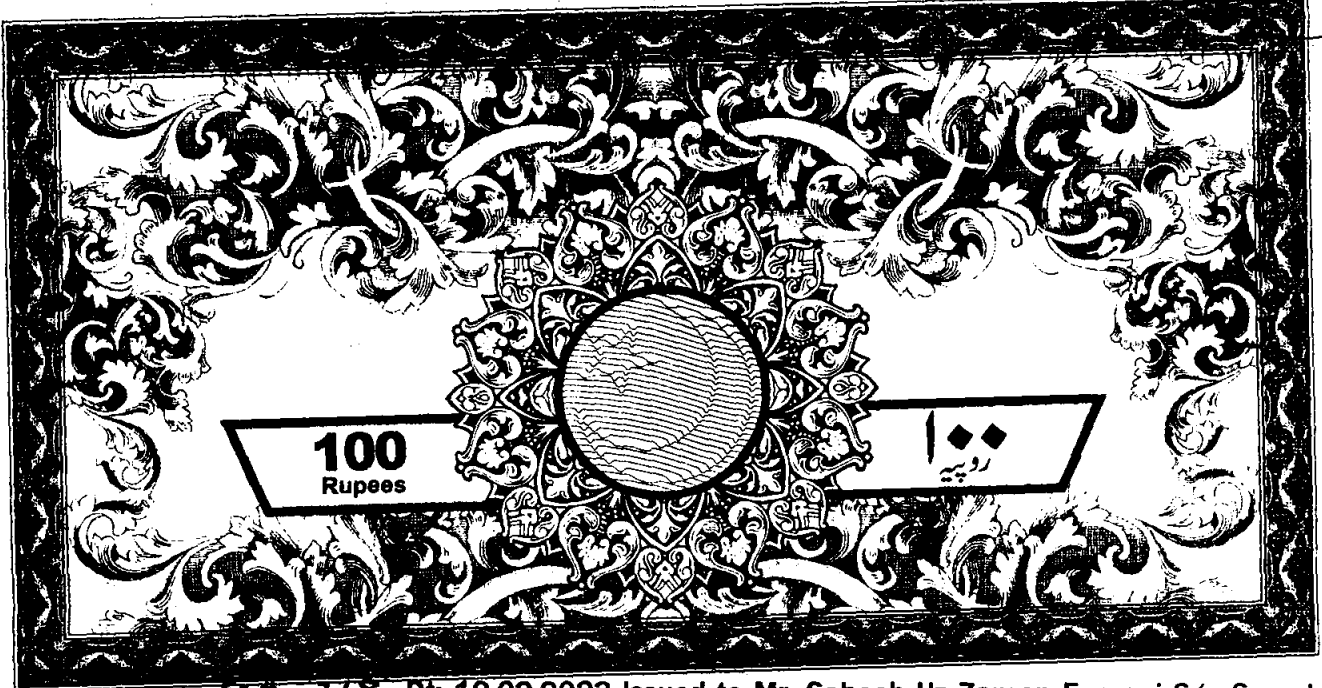
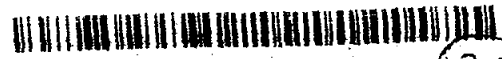

MUHAMMAD SAAD SHABBIR
Company Secretary

ATTESTED

COMPANY SECRETARY
CPGCL TPS GUDDU
02/02/2023

Cc: Chief Executive Officer, CPGCL (GENCO-II), Guddu.

ANNEX-O

AFFIDAVIT TO THE CORRECTNESS OF CONTENTS



Sl # 218 Dt: 10-02-2023 Issued to Mr. Sabeeh Uz Zaman Faruqui S/o Saeed Uz Zaman Faruqui R/o @ Present WAPDA Colony T.P.S Guddu Taluka & District Kashmore CNIC # 35201-7557263-7

Stamp Vendor Kashmore
District 10/02/2023

BEFORE THE NATIONAL ELECTRIC POWER REGULATORY AUTHORITY

Petition by the Central Power Generation Company Limited (GENCO-II) for Grant of a Separate Generation License for the 747 MW Combined-Cycle Power Plant at Guddu under section 14B of the Regulation of Generation Transmission & Distribution of Electric Power Act, 1997 read with Regulation 3 of the National Electric Power Regulatory Authority Licensing (Application Modification, Extension, and Cancellation) Procedure Regulations, 2021,

AFFIDAVIT

I, Sabeeh Uz Zaman Faruqui adult Muslim made, Chief Executive Officer and Authorised Representative of the Petitioner Company do hereby state on solemn affirmation that the contents of the accompanying application are true and correct to the best of my knowledge and belief, and nothing material has been concealed. I further affirm that all documents attached / annexed herewith, and information provided is true to the best of my knowledge and belief.

Deponent

Verified on oath on this ____ day of February 2023 that the contents of this Affidavit are true and correct to the best of my knowledge and belief and nothing has been concealed.

ANNEX-P

FUEL SUPPLY AGREEMENT

10

MSMTC
27/10/17

2017

LIMITED
("Buyer")

GENTRAL POWER GENERATION COMPANY



AND

("Seller")

PAKISTAN PETROLEUM LIMITED



BETWEEN

KANDHKOT GAS FIELD

FOR

GAS SALES AGREEMENT

228

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De L.D.

This GAS SALES AGREEMENT ("GSA") is made on this 23rd day of October, 2017 between:

PAKISTAN PETROLEUM LIMITED, a company incorporated under the laws of Pakistan, having its registered office at P.I.D.C. House, Dr. Ziauddin Ahmed Road, Karachi, 75530, Pakistan, and its successors and assigns; of the First Part, hereinafter also referred to as the "Seller"; and a reference to a "Seller" includes the successors in interest and assigns thereof; and

CENTRAL POWER GENERATION COMPANY LIMITED, a company incorporated under the laws of Pakistan, having its principal office at Thermal Power Station Guddu, District Kashmore, Pakistan, and its successors and assigns; of the Second Part, hereinafter referred to as "Buyer"; and a reference to a "Buyer" includes the successors in interest and assigns thereof.

The Seller and the Buyer are hereinafter also referred to individually as "Party" and collectively as "Parties".

WHEREAS:

The Seller is the holder of Kandhkot Mining Lease and Kandhkot Additional Development and Production Lease respectively in respect of Kandhkot Gas Field in District Kashmore, Sindh, (hereinafter referred to as 'Kandhkot Gas Field').

The Seller has made available for Buyer, Gas reserves within the Kandhkot Gas Field under this GSA.

The Buyer is desirous of purchasing the Gas from the Seller for the purpose of electricity generation.

The GOVERNMENT through the Ministry of Petroleum & Natural Resources' letter No. NG(II)-2(3)/15 dated 31 March 2017 has allocated the Gas to the Buyer.

Pursuant to this GSA, the Seller desires to deliver and sell Specification Gas to the Buyer and the Buyer desires to receive and purchase Specification Gas from the Seller.

The Seller is a party to a Gas Pricing Agreement, 2002 with the Government ("Sui and Kandhkot GPA") in respect of the price of Kandhkot Gas sold from Kandhkot Gas Field.

NOW THEREFORE in consideration of the covenants and agreements and Schedules herein contained, the Seller and the Buyer agree as follows:

[Handwritten signatures]

1) DEFINITIONS

1.1 In this GSA the following expressions shall have the following meanings:

"Annual Contract Quantity" or "ACQ" shall have the meaning as set out in Article 6;

"Adjusted ACQ" shall have the meaning as set out in Article 10.2;

"Affiliate" means in relation to any Party:

- i) a company or corporation that is, directly or indirectly, controlled by such Party;
Or
- ii) a company or corporation that, directly or indirectly, controls such Party; or
- iii) a company or corporation that is, directly or indirectly, controlled by a company or corporation that also, directly or indirectly, controls such Party.

For the purposes of this definition, "control" means the right to exercise the vote of more than fifty percent (50%) of all the voting rights;

"AGA No. 3" means the Gas Measurement Committee Report No. 3 Orifice Metering of Natural Gas of the American Gas Association;

"Article" shall mean an article in this GSA including its paragraphs;

"ASME" means American Society of Mechanical Engineers;

"ASTM" means American Society for Testing Materials;

"Atmospheric Pressure" shall mean an absolute pressure of fourteen decimal point sixty-five pound force per square inch (14.65 lbs./in²);

"Average Gross Calorific Value" means the weighted average over a Day's Gas delivered of the Gross Calorific Values by online continuous gas chromatograph (GC);

"BSCF" or "Bscf" means one billion standard cubic feet of Gas (1,000,000,000 ft³);

"British Thermal Unit" or its abbreviation "Btu" means the amount of heat required to raise the temperature of one pound of water from fifty nine degrees Fahrenheit (59°F) to sixty degrees Fahrenheit (60°F);

"Buyer's Delegate" means the person nominated in writing by the Buyer who is authorised to and shall act as representative of the Buyer as set out in Article 18.4;

"Business Day" means a day (other than a Saturday or a Sunday or a public holiday) on which the banks in Pakistan are open for business;

"Buyer's Facilities" means facilities referred to in Article 4.2;

"Buyer's Intimation" shall have the meaning as set out in Article 15.2;

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"Check Measurement Facilities" shall have the meaning as set out in Article 18.4;

"Contract Year" shall mean a period beginning at eight a.m. PST (08.00 Pakistan Standard Time) on the Effective Date and thereafter on 1st July in any calendar year, and ending at eight a.m. PST (08.00) on 1st July in the next succeeding calendar year, or, where the context so admits, part thereof;

"Day" means a period beginning at eight a.m. PST (08.00 Pakistan Standard Time) on a calendar day and ending at eight a.m. PST (08.00) on the next succeeding calendar day; and "Daily" shall be construed accordingly;

"Delivery Commitment" shall have the meaning as set out in Article 11.1;

"Delivery Point" shall have the meaning as set out in Article 13;

"Delivery Pressure" shall have the meaning as set out in Article 19;

"Disclosing Party" shall have the meaning as set out in Article 25;

"Duties" shall have the meaning as set out in Article 17;

"Effective Date" shall have the meaning as set out in Article 2;

"Expert" shall have the meaning as set out in Article 27;

"Fahrenheit" or its abbreviation "F" is a calculation of temperature based on the freezing point of water at thirty-two degrees F (32°F) and its boiling point at two hundred and twelve degrees F (212°F).

"Foot" shall mean zero decimal-point three-zero-four-eight meters (0.3048 m), as defined by the eleventh Conference Generale des Poids et Mesures at Paris, France, in 1960;

"Force Majeure" shall have the meaning as set out in Article 23;

"Gas" means all hydrocarbons which, at standard conditions of Atmospheric Pressure and temperature (sixty degrees Fahrenheit (60°F)) are in gaseous phase including non-hydrocarbon gases which are in association with and produced together with such hydrocarbons;

"Gas Composition" shall have the meaning as set out in Article 18.3 (vii);

"Gas Price" The pricing of all Gas delivered under this GSA and which shall be determined in accordance with the terms of the Sul and Kandhkot GPA, as amended or revised at any subsequent stage during the term of this GSA and which shall be read as part of this GSA and notified by the Competent Authority from time to time under applicable law;

"Gross Calorific Value" shall mean that number of BTUs produced by the complete combustion at Atmospheric Pressure of one (1) cubic foot of Gas at sixty degrees Fahrenheit (60°F) with excess air at the same temperature and pressure as the Gas when the products of combustion are cooled to sixty degrees Fahrenheit (60°F) and when the

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water formed by combustion is condensed to the liquid state and when the products contain the same total mass of water vapour as the Gas and air before combustion;

"Gas Specification" shall have the meaning as defined in Schedule 1;

"Kandhkot Additional Development and Production Lease" means the Lease No. 148/PAK/2002 granted by the President of Pakistan to the Seller in respect of Kandhkot Gas Field.

"Kandhkot Gas Field" means the gaseous hydrocarbon accumulation in the Sui Main Limestone, Sui Upper Limestone and Habib Rahi Limestone within the Kandhkot Mining Lease Area and Kandhkot Additional Development & Production Lease Area, generally known as the Kandhkot Gas Field.

"Kandhkot Mining Lease" means the Mining Lease No. 11/West Pakistan granted by the President of Pakistan to the Seller in respect of Kandhkot Gas Field as amended from time to time or any other development and production lease granted by the President of Pakistan in respect of the areas covered in the Kandhkot Mining Lease.

"Levies" shall have the meaning as set out in Article 17.2;

"Maintenance" shall have the meaning as set out in Article 12;

"Maximum ACQ" shall have the meaning as set out in Article 6;

"Measurement Equipment" shall have the meaning as set out in Article 18.1;

"Measurement Point" shall have the meaning as set out in Article 18.1;

"Minimum ACQ" shall have the meaning as set out in Article 6;

"Month" means a period beginning at eight a.m. (08.00 hours) on the first day of a calendar month and ending at eight a.m. (08.00 hours) on the first day of the next calendar month and "Monthly" shall be construed accordingly;

"Monthly Invoice" shall have the meaning as set out in Article 16.1;

"Monthly Nomination" shall have the meaning as set out in Article 7;

"Month's Revised Take-or-Pay Quantity" shall be the Revised Take-or-Pay Quantity as calculated in accordance with Article 16 for the relevant Month;

"MMBTU" means million (10⁶) Btu;

"Mscf" means one thousand standard cubic feet of Gas (1,000 ft³);

"MMscf" means one million Standard Cubic Feet of Gas (1,000,000 ft³);

"MMacfd" means million (10⁶) standard cubic feet per day;

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"Notice" means a notice issued in accordance with Article 32;

"Notified Gas Price" means the price of Specification Gas as determined in accordance with the terms of Sui and Kandhkot GPA for the Kandhkot Gas Field and notified by the Competent Authority from time to time under the applicable law.

"Off-Specification Gas" means Gas delivered at the Delivery Point, which does not strictly meet the Gas Specification as set out in Schedule-1;

"PST" means Pakistan Standard Time;

"Pakistan Rupee" or "Rs" means the legal tender of the Islamic Republic of Pakistan;

"Party" means a party to this GSA, which is the Seller, and the Buyer, and "Parties" shall be construed accordingly;

"Price Determining Authority" (PDA) means the Oil and Gas Regulatory Authority or any other Authority appointed by the Government from time to time.

"Psig" means pounds force per square inch gauge, where "gauge" means pressure above Atmospheric Pressure;

"Revised Take-or-Pay Quantity" shall have the meaning as set out in Article 16.1;

"Seller's Delegate" means the person nominated in writing by the Seller who is authorized to and shall act as representative of the Seller as set out in Article 18.4;

"Seller's Facilities" shall mean the facilities as referred to in Article 4.2;

"Seller's Intimation" shall have the meaning as set out in Article 15.2;

"Specification Gas" means dehydrated gas produced from the Kandhkot Gas Field and delivered to Buyer at the Delivery Point, which conforms strictly to the Gas Specification as set out in Schedule-1 hereto;

"Standard Cubic Foot" or "SCF" or "scf" shall mean, when applied to Gas, that quantity of Gas, which at sixty degrees Fahrenheit (60°F) and Atmospheric Pressure and the Gas being saturated with water vapour at the same temperature and pressure occupies one (1) cubic foot;

"Take-or-Pay" shall have the meaning as set out in Articles 10;

"Take-or-Pay Quantity" shall have the meaning as set out in Article 10;

"Technical Dispute" shall have the meaning as set out in Article 27;

"Term" shall be the period of this GSA as specified in Article 3;

"US Dollars" or "US\$" means the legal tender of the United States of America

Handwritten initials/signature

2) EFFECTIVE DATE

- 2.1 This GSA shall be effective from 8 May 2013 hereinafter referred to as the "Effective Date". The Buyer undertakes to discharge and fulfill all its liabilities, obligations and dues for the gas supplied up to the Effective Date, under the previous gas sales arrangement.
- 2.2 Each of the Parties hereby represents that it has obtained all necessary governmental, statutory and third party approvals and permissions that it requires to enter into and perform this GSA.

3) TERM

- 3.1 This GSA shall come into force on the Effective Date and shall continue in force till the lease life of the Kandhkot Gas Field unless earlier terminated in accordance with the provisions of this GSA.

4) FACILITIES

- 4.1 The Buyer undertakes that, at its sole cost, risk and expense, it will provide, construct and install pipelines and equipment to be necessary for the quantities of Specification Gas to be delivered by the Seller at the Delivery Point and accepted by the Buyer in accordance with this GSA. The said pipelines and necessary equipment referred to above are herein collectively referred to as the 'Buyer's Facilities'. Buyer's facilities shall be capable of accepting the maximum and declining delivery rates.
- 4.2 The Seller undertakes that, at its sole cost, risk and expense, it will provide, construct and install wellheads, gas gathering lines, separation equipment, compression, dehydration and metering and quality measurement instruments to be necessary for the quantities of Specification Gas to be produced and delivered to the Buyer at the Delivery Point in accordance with this GSA. The said wellheads, gas gathering lines, separation equipment, compression, dehydration and metering and quality measurement instruments referred to above are herein collectively referred to as the "Seller's Facilities". Seller's Facilities shall be capable of delivering the maximum and declining delivery rates.

5) SALE AND PURCHASE

- 5.1 From Effective Date, Seller agrees to deliver and sell and Buyer agrees to accept and pay for Specification Gas at the Delivery Point in such quantities and in such manner as from time to time agreed under this GSA.

6) ACQ

- 6.1 From the Effective Date until 1st June 2017 or until such date that the new pipeline is commissioned by the Buyer, the Seller will supply the Specification Gas.

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From the date on which the new pipeline is commissioned, the Seller will supply the Specification Gas of 180 MMscfd which will gradually be increased to 200 MMscfd per Contract Year (ACQ).

6.2 Subject to Article 10.2, starting from 1 June 2017 or the date of commissioning of the new pipeline, ACQ for the first twelve months period shall be 69,000 MMSCF, and 73000 MMscf for the next three (3) twelve months period each, provided however that the rate of ACQ after first three twelve months period for the remaining period will be reviewed and decided by the Parties with mutual consent keeping in view the Kandhkot Gas Field reservoir's behavior and study.

7) MONTHLY NOMINATIONS

7.1 For each Contract Year Seller shall, by six (6) Months advance notification to the Buyer, nominate and deliver at the Delivery Point the quantity of Specification Gas to be supplied in such Months provided that:

- i) the total of the Seller's monthly nominations through each Contract Year shall be equal to the respective ACQ for such Contract Year; and
- ii) the individual nominations for a Month after 1st June 2017 or until such date that the new pipeline is commissioned by the Buyer, whichever is earlier, shall be at least equal to seventy two and half percent (72.5%) of the ACQ for such Contract Year divided by three hundred and sixty five (365) and multiplied by the number of days in such Month.

8) BUYER'S INABILITY TO ACCEPT SPECIFICATION GAS .

8.1 Should Buyer foresee any inability to accept Specification Gas as nominated by Seller for any Month, Buyer may, by giving forty eight (48) hours notice to Seller, notify a lower quantity of Specification Gas to be supplied in such Month provided that such lower quantity shall not be deemed to adjust the ACQ for the relevant Contract Year.

9) SELLER'S OBLIGATION TO SUPPLY

9.1 The Seller's obligation to tender Specification Gas for delivery shall be:

- i) in any one Month the Seller's nomination for that Month, as adjusted by Buyer's reduction of Seller's nomination in accordance with Article 8, Maintenance and Force Majeure; and
- ii) in any one Contract Year the ACQ for that Contract Year, as adjusted by Buyer's reduction of Seller's nomination in accordance with Article 8, Maintenance and Force Majeure (if any) accrued during the Contract Year in accordance with Articles 9.1 (i) and 19; provided always that for such periods where the pressure of Gas equals or exceeds 500 five hundred psig at the

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Delivery Point, the Seller shall be deemed to have fulfilled his delivery obligations as aforesaid.

9.2 Subject to Articles 7 and 8 and unless agreed otherwise by Buyer and Seller, Seller agrees that deliveries of Specification Gas shall not exceed 200 MMscfd at a pressure required to allow the delivery of the quantity of Specification Gas required by the Buyer, provided such pressure shall not exceed a maximum pressure of five hundred (500) psig at the Delivery Point.

10) BUYER'S OBLIGATION TO ACCEPT

10.1 From the date new pipeline is commissioned by the Buyer and thereafter in each Contract Year the Buyer shall accept and pay for a minimum annual quantity of Specification Gas equal to seventy two and half percent (72.5%) (hereinafter referred to as "Take-or-Pay") of the Adjusted ACQ (hereinafter referred to as "Take-or-Pay Quantity") at the Notified Price, provided that:

- i) If the Buyer takes less than the Take-or-Pay Quantity then, except as otherwise provided in this Agreement, it shall nonetheless pay for the Take-or-Pay Quantity;
- ii) Monthly billing will be carried out using the Month's Revised Take-or-Pay Quantity;

10.2 In any one Contract Year the "Adjusted ACQ" shall be a quantity equal to the ACQ reduced by the sum of Gas quantities not delivered by Seller or not accepted by Buyer due to Seller's or Buyer's Maintenance and Specification Gas quantities deferred due to Force Majeure.

10.3 Subject to Articles 6, and 7 and unless agreed otherwise by Buyer and Seller, Buyer agrees that it will accept deliveries of Specification Gas at a pressure required to allow the delivery of the quantity of Specification Gas required by the Buyer, provided a pressure of five hundred (500) psig is maintained at the Delivery Point.

11) SELLER'S CUMULATIVE DELIVERY COMMITMENT

11.1 The Delivery Commitment

- i) Seller undertakes to make available for delivery in accordance with Article 19 at the Delivery Point at least a quantity of Specification Gas equal to 72.5% of the Adjusted ACQ as determined from time to time (hereinafter referred to as the "Delivery Commitment").
- ii) In any month, If the Seller is unable to deliver at least a quantity of Specification Gas equal to seventy two and half percent (72.5%) of the Adjusted ACQ, then the Seller shall pay to the Buyer an amount, by the way of liquidated damages, equal to the price of shortfall in supply of the Month's Revised Take-or-Pay Quantity at the prevailing Notified Price.

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- iii) The Seller shall not be liable for failure to supply Take or Pay Quantity of Gas which the Seller was prevented from delivering or which the Buyer was prevented from accepting by reason of Force Majeure or for failure to supply Take or Pay Quantity of Gas which the Seller could not deliver by reason of a breach of the terms of this GSA by the Buyer, which breach prevents Seller from delivering such Gas.

12) MAINTENANCE

12.1 The Seller and the Buyer shall coordinate and, if applicable, jointly notify Maintenance periods in advance, provided that for such periods the Seller shall not be liable for failure to deliver and the Buyer shall not be liable for failure to accept Specification Gas provided however that in no circumstance whatsoever the cumulative Maintenance periods shall not exceed fifteen (15) days in any Contract Year.

12.2 If the Seller's Maintenance will result in a reduction of Specification Gas deliveries on Days other than those jointly notified or notified by the Buyer for Maintenance then the Seller may give notice and reduce Specification Gas deliveries, provided that:

- i) Each Indicative notice of Maintenance periods shall be served 30 Days before the Maintenance/turnaround;
- ii) The Buyer shall use reasonable endeavors to accommodate subsequent revisions of Maintenance periods, provided Seller has given at least twenty four (24) hour advance notice thereof;
- iii) Specification Gas deliveries during any Contract Year may only be reduced on no more than cumulative fifteen (15) Days;
- iv) To the extent reasonably possible, Specification Gas delivery reductions shall be in the period of April to October inclusive; and

12.3 If the Buyer's Maintenance will result in a reduction of Specification Gas off-take on Days other than those jointly notified or notified by the Seller for Maintenance then the Buyer may give notice and reduce Specification Gas off take, provided that:

- i) Each Indicative notice of Maintenance periods shall be served before 31st October of the previous Contract Year;
- ii) The Seller shall use reasonable endeavors to accommodate subsequent revisions of Maintenance periods, provided Buyer has given at least twenty four (24) hour advance notice thereof;
- iii) Specification Gas off take during any Contract Year may only be reduced on no more than cumulative fifteen (15) Days;

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- ly) To the extent reasonably possible, Specification Gas off take reductions shall be in the period of April to October inclusive, and
- v) The Buyer shall not be liable for failure to accept Specification Gas.

13) DELIVERY POINT

13.1 The Delivery Point of Specification Gas for the purpose of this GSA shall be the flange downstream of the Seller's sales meter station already installed at the downstream of the dehydration plant hereinafter referred to as "Delivery Point".

14) NOTIFIED PRICE

14.1 The pricing of all Gas delivered under this GSA shall be as notified by the Competent Authority, from time to time, under the terms of the Sui and Kandhkot GPA as amended or revised at any subsequent stage during the Term of this GSA and which shall be read as part of this GSA.

15) OFF SPECIFICATION GAS

15.1 Schedule - 1 describes the Gas specifications for Specification Gas, provided however that Gas delivered which deviates from the Gas Specifications for a total period not exceeding four (4) hours on any Day shall be deemed Specification Gas and any such Gas delivered thereafter shall be Off-Specification Gas. Buyer shall have no obligation whatsoever to purchase and take Off-Specification Gas from the Kandhkot Gas Field, except as provided in this Article 15.

15.2 Both Seller and Buyer (provided that Buyer is in a position to discover Off-Specification Gas) shall at all times have the obligation to immediately notify the other in the event that either party discovers that Off-Specification Gas has been, or is currently being, delivered. If Buyer is the party making such discovery and Off-Specification Gas is currently being delivered, then Buyer shall immediately (but in any event within one (1) hour) notify Seller by fax ("Buyer's Intimation") and shall include in Buyer's Intimation the observed variations of the received Gas from the Gas specifications as per Schedule 1 and whether or not Buyer desires to continue to receive such Off-Specification Gas from the Kandhkot Gas Field. If Buyer notifies Seller to cease such deliveries, then Seller shall cease such deliveries as soon as reasonably possible. If Seller is the party making discovery of Off-Specification Gas deliveries, then Seller shall immediately (but in any event within one (1) hour) notify Buyer by fax ("Seller's Intimation") and shall include in Seller's Intimation the observed variations of the delivered Gas from the Gas specifications as per Schedule 1 and Buyer shall respond immediately by fax (but in any event within one (1) hour) to Seller's Intimation and such response from Buyer shall be considered Buyer's Intimation and in the provisions of this Article 15 shall apply thereto.

15.3 All Off-Specification Gas from the Kandhkot Gas Field of which Buyer takes delivery pursuant to any Buyer's Intimation to accept delivery, or as agreed by Buyer and Seller from time to time, shall be deemed Specification Gas and be

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deemed to be part of the Estimate, the Delivery Commitment, the ACQ and the Monthly Nominations and/or any other nominations and shall be priced at the Notified Price.

15.4 All Off-Specification Gas from the Kandhkot Gas Field of which Buyer has taken delivery prior to Seller ceasing delivery of same in accordance with any Buyer's Intimation to not accept delivery shall be free of charge to Buyer.

15.5 If the quantity of Off-Specification Gas from the Kandhkot Gas Field is not known, then one half of the quantity of Gas from the Kandhkot Gas Field delivered since such Gas deliveries were last known to be in compliance with the Gas Specification shall be deemed to be Specification Gas and the other half shall be deemed to be Off-Specification Gas.

15.6 The parties hereby agree that due to changing gas characteristics in the three domes at Kandhkot Gas Field, the increase or decrease in production and the possibility of change in reservoir behavior, the specifications of the gas provided under this GSA shall be examined on completion of every two (2) contract years and the Schedule-1 and the relevant clauses hereto, shall be amended with the mutual consent of the Parties.

16) PAYMENT

16.1 Monthly Invoice

By the seventh (7th) of each Month beginning with the Month immediately following the Month in which first deliveries of Specification Gas commence hereunder, the Seller shall render an invoice in Pakistan Rupee to the Buyer in respect of the preceding Month showing the information detailed below (hereinafter referred to as "Monthly Invoice"):

- i) Total quantity of Specification Gas delivered by the Seller on each day of (hereunder during) such Month expressed in Mcf and MMBTU with gross average calorific value as measured by the measurement equipment, the Monthly Nomination and the ACQ enforce
- ii) Details of any reduction or curtailment of deliveries of Specification Gas during that Month as a result of Maintenance or Force Majeure;
- iii) Month's Revised Take-or-Pay Quantity for that Month which shall take account of (a) Monthly Nomination of Specification Gas for such Month, and (b) supply restrictions in such Month due to Maintenance, and Force Majeure. The Month's Revised Take-or-Pay Quantity shall be calculated as follows:

$$\text{Month's Revised Take-or-Pay Quantity} = \frac{\text{ACQ} * \text{VGDE} * \text{Take-or-Pay}}{\text{DAYS}}$$

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Where:

ACQ = Annual Contract Quantity

DAYS = Number of Days during the relevant Contract Year

VGDE = The "Volume of Gas in Days Equivalent" is calculated by dividing the quantity of Gas delivered during a Month (after taking into account supply restrictions in the Month due to Maintenance) and Force Majeure) by the Nominated Daily Production Rate for such Month. The "Nominated Daily Production Rate" for a Month is calculated by dividing the Monthly Nomination by the number of Days in such Month.

Take-or-Pay = Take-or-Pay in accordance with Article 10, as applicable.

- iv) The average Gross Calorific Value of Specification Gas delivered in the Month;
- v) The applicable Notified Price;
- vi) any tax and/or Levies and/or Duties for that Month being the obligation of Buyer which the Seller is obliged to collect under any applicable law in Pakistan;
- vii) the amount of royalties payable in Pakistan Rupees by the Seller to the GOVERNMENT for that Month.

16.2 Annual Reconciliation

16.2.1 Following 30 June each Contract Year, the Seller shall render to the Buyer a statement (the "Annual Reconciliation") as soon as possible, but not later than 1st August, showing the information set out below for the previous Contract Year:

- i) Total quantity of Specification Gas delivered in that Contract Year expressed in SCF and MMBTU as measured by Measurement Equipment;
- ii) The sum total of the Monthly Nominations for that Contract Year;
- iii) The ACQ for that Contract Year;
- iv) The ACQ adjusted for Force Majeure and Maintenance ("Adjusted ACQ") for that Contract Year;
- v) Any tax and/or Levies and/or Duties for that Contract Year being the obligation of Buyer which the Seller is obliged to collect under any applicable law of Pakistan.

16.3 Payment Procedure

16.3.1 The Buyer shall pay Seller's Monthly Invoice for all Specification Gas delivered hereunder by the Seller at the Delivery Point in the preceding Month at the relevant Notified Price as applicable, plus any tax and/or Levies including Gas Development

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Surcharge (GDS) and Gas Infrastructure Development Cess (GIDC) and/or Duties being the obligation of Buyer which the Seller is obliged to collect under any applicable law in Pakistan.

- i) In respect of Specification Gas delivered and payable in Pakistan Rupees, and tax and/or Levies and/or Duties in respect of the same, but excluding excise duties and sales tax, within thirty (30) Days on receipt of Monthly Invoice by the Buyer, and
- ii) In respect of excise duties and sales tax being the obligation of the Buyer to pay, within Thirty (30) Days, from the date upon which the Seller's Monthly Invoice issued in accordance with Article 17.1 is received by the Buyer; provided that if a bank designated pursuant to this Article is closed on the due date of the Monthly Invoice, the relevant payment shall be made on the next Business Day.

16.3.2 Payment by the Buyer against the Monthly Invoice shall be made by telegraphic transfer to the relevant bank account specified below for Seller and if appropriate, the GOVERNMENT:

A/C. Pakistan Petroleum Ltd.
 Account No. PLS Unisaver A/c. No. 1200035-5
 Bank: United Bank Ltd
 Bank Address: Corporate Branch, I. I. Chundrigger Road, Karachi
 IBAN # PK98UNIL0112052512000355

To the GOVERNMENT (for any Royalty Gas, if royalty is paid in kind) in PAKISTAN Rupees to the State Bank of Pakistan using below mentioned codes in the payment challan;

1300000 - Miscellaneous receipts
 1390000 - Others
 1391000 - Other receipt
 1391008 - Receipts under the Mines and Oil Fields and Mineral Development (Federal Control) Act 1948

16.3.3 If the monthly invoice is not paid by the Buyer within thirty (30) days after the receipt by the Buyer of the Seller's invoice, the Seller shall charge and the Buyer shall pay interest at two and a half percent (2.5%) above the Karachi Interbank Offered Rate (KIBOR), for the period commencing on the expiry of thirty (30) days subsequent to the receipt of the Seller's bill by the Buyer till the date on which all amounts due and not paid by the Buyer to the Seller are paid.

16.3.4 In the event of any Monthly Invoice being in dispute or containing an error, the Buyer shall notify Seller of such dispute or error within fifteen (15) Days (excluding the weekly holiday and gazetted holidays in Pakistan) of receipt of such Monthly Invoice, specifying the amount which is in dispute or the error therein. The Seller shall issue a replacement invoice for the amount not in dispute or a corrected invoice, as the case may be, within five (5) Days (excluding the weekly holiday and

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gazetted holidays in Pakistan) of receipt of such notice from Buyer. The amount not in dispute shall be paid in accordance with the due date of the original Monthly Invoice, and such corrected invoice shall be paid in accordance with the foregoing provision of this Article. In the event that any portion of an invoice was in dispute, once it is settled:

- i) if the Buyer was at fault, Buyer shall pay the Seller in accordance with the foregoing provisions of this Article with late payment charge calculated in accordance with this Article from the due date of the original invoice; and
- ii) if the Seller was at fault and excess payment has been made, Seller shall repay immediately to Buyer such excess payment.

16.3.5 If the Notified Price is adjusted upward / downward in accordance with the applicable Sui and Kandhkot GPA for any Month after the invoice in respect of that Month has been issued by the Seller the adjustment for same shall be made through Debit / Credit Notes after the receipt of notification and the payment of next invoice will be settled after adjustment of such Debit / Credit Notes from preceding Month.

16.3.6 The mode of payment set out herein shall apply *mutatis mutandis* to payments due from the Seller to the Buyer under this GSA.

17) DUTIES AND TAXES

- 17.1 It shall be the responsibility of the Seller to pay all royalties and taxes on income in accordance with the relevant laws of Pakistan. Such part of the Monthly Invoice being equal to the amount payable as royalties in Pakistan Rupee by the Seller to the GOVERNMENT shall be invoiced and paid by the Buyer in Pakistan Rupee.
- 17.2 All taxes, charges, fees, excise duty, Gas development surcharge, Octroi duty and any other surcharge, duty or penalties relating thereto levied in respect of the Gas now or in the future (collectively referred to as the "Levies") shall be paid by Seller if such Levies are imposed on the Gas before the Delivery Point and by the Buyer beyond the Delivery Point.
- 17.3 Sales tax, excise duty and other similar taxes on Gas sales of whatever description ("Duties"), which Seller is obliged by applicable law to collect from Buyer, levied now or in the future on the Gas from Kandhkot Gas Field shall be determined, invoiced and remitted by the Seller on behalf of the Buyer to the concerned Government agency in accordance with the prevailing laws and/or rules.
- 17.4 The Seller shall invoice the Buyer for Duties and Levies in the following manner:
 - i) Seller shall promptly invoice Buyer for the amount of Duties and Levies payable on a Monthly basis or such basis as may be prescribed by the applicable laws;

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ii) Buyer shall pay Seller's invoice inclusive of Duties and Levies, following receipt of such invoice by Buyer, in accordance with Article 16.3.1 (i), and (ii), provided that Seller's invoice in accordance with Article 16.1.

iii) The Parties acknowledge that pursuant to Article 16.1 payment may be made prior to delivery of Gas and shall reasonably accommodate each other to legally optimize the taxes, Levies and Duties on payment for such not yet delivered Gas to the maximum extent permissible under applicable law.

18) GAS MEASUREMENT AND RECORDING

18.1 Seller shall install immediately upstream of the Delivery Point (hereinafter referred to as "Measurement Points") such measurement and recording facilities as are necessary to measure and record, in accordance with this GSA, the volume, the Gross Calorific Value and all other specifications of the Gas delivered to the Buyer at the Delivery Point (the "Measurement Equipment"). Subject to this Article 18, the Measurement Equipment shall be used for all measurements of Gas delivered at the Delivery Point hereunder.

18.2 All Gas volumes sold at the Delivery Point shall be reckoned at standard conditions of pressure and temperature (being 60 degree Fahrenheit and 14.65 lbs./in2).

18.3 All volumetric Gas measurements shall be by orifice flow metering in accordance with the recommendation of latest AGA No.3 employing all the relevant corrections stipulated therein and the Gas measuring equipment shall conform to standards therein contained. For that purpose:

- i) The temperature of the Gas shall be measured by a continuously recording device installed such that it may record the temperature of Gas flowing through the orifice flow meters; and
- ii) The volume of the Gas delivered shall be determined in accordance with the AGA Report No.3 based upon data from the orifice flow meters and Gas calorimeter and gravitometer.
- iii) The energy of the Gas delivered shall be determined by continuous integration of the volume of Gas delivered and the Gross Calorific Value.
- iv) The Average Gross Calorific Value of the Gas delivered shall be determined by using continuous type calorimeter / recorder.
- v) The total water content of the Gas delivered shall be determined by the Seller using online continuous type dew point apparatus.
- vi) The H₂S content of the Gas delivered shall be determined by the Seller by means of online continuous recorder.

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vii) Specific gravity determinations shall be based upon compositional analysis of the delivered Gas, carried out from time to time by collecting samples from immediately upstream of the orifice flow meters. The compositional analysis shall be capable of identifying: methane, ethane, propane, iso-butane, normal-butane, iso-pentane, normal-pentane, hexane, all remaining hydrocarbons lumped together as "C7+", nitrogen, carbon dioxide and any other gaseous component equal to or in excess of 0.1% mole (hereinafter referred to as "Gas Composition"). If the value of C7+ exceeds 0.1% mole, then Seller shall provide a report detailing each component in excess of 0.01% mole. Determination of Gross Calorific Value from the measured composition shall be in accordance with ASTM standards.

- 18.4 The Buyer may, at its own cost, risk and expense, install downstream of the Delivery Point such "Check Measurement Facilities" as it may deem necessary to verify the volume measurement of the Gas and the Gross Calorific Value of the Gas delivered to the Buyer's Facilities on any Day. Such Check Measurement Facilities shall not adversely affect the operation and reliability of the Seller's Measurement Equipment or Seller's Facilities. Each of the Seller and the Buyer shall have the exclusive right to operate its Measurement Equipment and Check Measurement Facilities, respectively, but each may present itself to the other party's nominated representative (referred to as "Buyer's Delegate" and "Seller's Delegate") to witness reading, calibration, testing and/or installation of its measurement and recording facilities. Buyer's Delegate and Seller's Delegate shall also have the right of access any time during twenty four (24) hours to the other party's Measurement Equipment and Check Measurement Facilities, respectively for inspection. The records obtained from such instruments shall remain the property of their owner, but upon request each of the Buyer and the Seller shall provide to the other party's representative its records, together with calculations derived there from, for inspection and verification.
- 18.5 At least once every Month, or such longer period as Buyer and Seller may agree in writing, each of the Seller and the Buyer shall calibrate and verify at its own cost the accuracy of its Measurement Equipment and Check Measurement Facilities, respectively, by its own technicians or an unbiased third party acceptable to Buyer and Seller and the other party shall be invited, with at least seven (7) Days' notice, to be present during such calibration or verification. Additionally, either party may notify the other for a special testing on twenty-four (24) hour notice to secure accuracy of the other party's Measurement Equipment and Check Measurement Facilities, as applicable, whereupon the other party shall co-operate and arrange for such a test being undertaken and the objective of the test to be achieved, provided that such special testing shall not be carried out with unreasonable frequency. Each party shall, without closing down a metering stream, "zero check and recalibrate" its Measurement Equipment and Check Measurement Facilities, as applicable, at least once a week.
- 18.6 In the event of Seller's Measurement Equipment being out of service or registering inaccurately, the volume of the Gas sold shall be estimated using the first of the following methods which is feasible:

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- i) By using the registration of Buyer's Check Measurement Facilities if installed and accurately registering;
- ii) By correcting the error if the proportion of the error is ascertainable by calibration or test, or analytically in accordance with acceptable Gas industry practice;
- iii) By estimating the volume of Gas delivered by comparison with past deliveries during a period of similar conditions when the Measurement Equipment was registering accurately.
- iv) Any other suitable method agreed by Buyer and Seller.

18.7 If, upon test as provided in this Article 18 above:

- i) Any single unit measuring equipment being part of the Measurement Equipment is found to be inaccurate within plus or minus one per-cent ($\pm 1\%$) of the true value then previous recordings of such equipment shall be reckoned as correct for computing Gas deliveries, but the equipment shall be promptly adjusted to operate, register and record correctly; continuous operation of such equipment by way of treating the aforesaid allowance of plus or minus one per cent ($\pm 1\%$) as an all-time tolerance in its acceptable accuracy shall not be permitted;
- ii) Any single unit measuring equipment being part of the Measurement Equipment is found to be inaccurate in excess of plus or minus one per-cent ($\pm 1\%$) of the true value then, for the period for which such measuring equipment has been known or can be agreed upon by Buyer and Seller to have been so inaccurately functioning, the record and reading of such measuring equipment for the whole period shall be corrected to zero error. If, however, the period of such inaccurate functioning measuring equipment is not known or cannot be agreed upon by Buyer and Seller, then for the period equivalent to one-half of the time elapsed since such equipment was last found to be plus or minus one per cent ($\pm 1\%$) accurate, the equipment's record and reading shall be adjusted to zero error.

18.8 The unit of volume for the purpose of measurement of Gas deliveries and Gas offtakes herein shall be Standard Cubic Foot of Gas. The unit of energy for sales and billing of Gas shall be MMBtu.

18.9 The Seller shall, at its sole cost, furnish to the Buyer the following data pertaining to the Gas supplied in frequency and by mode of transmittal as indicated:

- (a) Convey to the Buyer at Gas Control Centre Guddu by telephone every hour, or as may be agreed by Buyer and Seller, the following data in regard to Gas delivered at the Delivery Point during the preceding hour:

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- (i) Average volumetric flow rate in MMscfd;
- (ii) Average gauge pressure in psig;
- (iii) Average temperature in degrees F; and

(b) Convey to the Buyer by telephone or fax or e-mail every Day, as may be agreed by Buyer and Seller, the following data in regard to Gas delivered at the Delivery Point during the preceding Day:

- (i) Total Gas deliveries in MMacf;
- (ii) Average gauge pressure in psig;
- (iii) Average temperature in degrees F;
- (iv) Average Gross Calorific Value in Btu per scf;
- (v) Average specific gravity;
- (vi) Average hydrogen sulphide in grain per 100 scf; and

(c) Convey to the Buyer by letter the following information, along with the Monthly Invoice, in regard to Gas delivered at the Delivery Point during the preceding Month:

- (i) Average specific gravity;
- (ii) Average Gross Calorific Value in Btu per scf. In the event that due to Force Majeure Seller cannot determine "Gross Calorific Value" for any given reason then: the respective Gross Calorific Value shall be deemed to be, for the purpose of billing on an interim basis, the Gross Calorific Value pursuant to Buyer's equipment and if same is unavailable then those available from the last preceding Day when such respective Gross Calorific Values were available. Once accurate Gross Calorific Values are obtained, the next succeeding Monthly billing shall contain adjustments as may be required in order to correct any excess or deficiency in the amount of previous billings which was caused by using such previously applicable Gross Calorific Values on an interim basis; and
- (iii) Details about Off-Specification Gas delivered, if any.

18.10 The Seller shall preserve for a period of at least two (2) years all test data, billing charts and other similar records applicable for Gas measurements under this Article, which will be made available to the Buyer at reasonable times following reasonable notice.

18.11 For the purpose of measuring Gas and its specifications delivered hereunder the standards, methods and procedures set out in this Article 18, including AGA No.3 and ASTM, shall be applicable and binding for computations performed by the Measurement Equipment throughout the Term of this GSA. Any change in or deviation from such standards, methods and procedures by any Party shall not be binding on the other Party, unless agreed by Buyer and Seller in writing.

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18.12 No later than the seventh Day of every Month the Buyer's Delegate will visit Kandhkot Gas Field for joint calculation of the Gas volumes taken by the Buyer during the last Month. The Buyer's Delegate may also visit and check the Measurement Equipment to certify that the same was registering correctly. Both Buyer's and Seller's Delegates will jointly sign the certificate indicating volume of Gas supplied during the last Month and hand over the original copy of jointly signed certificate to the Seller's Delegate.

19) DELIVERY PRESSURE

19.1 Subject to the provisions of this GSA, Seller shall deliver and Buyer shall accept Specification Gas at a pressure required to allow delivery of the quantity of Gas required by the Buyer, provided a pressure of five hundred (500) psig is maintained at the Delivery Point (hereinafter collectively referred to as "Delivery Pressure"). The Buyer shall also maintain such differential pressure at the Buyer side of the Delivery Point, which will enable the Seller to deliver the Monthly Nomination of Gas into the Buyer's Facilities at the pressure specified in this Article 19 above.

19.2 The Buyer and Seller may mutually agree for lower Delivery Pressures to facilitate optimization of their respective facilities.

20) NOT USED

21) PROPERTY, RISK AND LIABILITY

21.1 Title to and property in and the risk attached to the Gas delivered pursuant to this GSA shall pass to the Buyer at the Delivery Point.

22) FURTHER GAS RESERVES

22.1 If part of the Gas reserves of the Kandhkot Gas Field would remain un-produced at the end of the Term and such Gas could be economically recovered, transported, processed and delivered as Specification Gas, the Term of this GSA shall be extended for an appropriate period on mutually agreed terms and conditions, to allow such reserves to be economically produced, provided that at least twelve (12) Months advance notice in writing to that effect is given by the Seller to the Buyer.

23) FORCE MAJEURE

23.1 In the event of Force Majeure the obligations of the Parties (other than the obligation to pay money as provided by this GSA) shall be excused for the time and to the extent that performance thereof is prevented wholly or in part by Force Majeure.

23.2 "Force Majeure" shall include but not be limited to:

- i) natural disasters, including but not limited to cyclones, epidemics, landslides, earthquakes, floods and washouts;

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- ii) strikes or other industrial disturbances which prevent the delivery or acceptance of Gas at the Delivery Point;
- iii) governmental or semi-governmental law, regulation, order, decree, restriction, restraint, prohibition, intervention or expropriation, or the failure of any governmental entity to act;
- iv) explosion, collision, radiation, act of the public enemy, act of war (declared or undeclared), blockade, riot, civil commotion or disturbance, sabotage, insurrection or national emergency (whether in fact or law);
- v) unavoidable accident;
- vi) freezing of wells or leakage and/or rupture of pipelines, partial or entire failure of natural Gas reserves, or non-availability or shortage of Gas due to failure of wells, natural causes or exhaustion of field;
- vii) any other relevant event or circumstances outside the reasonable control of the Party affected thereby, provided that a lack of funds shall not constitute Force Majeure; provided that such event or circumstances listed in paragraphs i) to vii) above is not within the control of the Party affected thereby and it causes or results in default or delay in the performance by such affected Party of any of its obligations hereunder and then only to the extent to which such Party, acting reasonably, is not able to prevent or overcome that event or circumstance.

23.3 A Party claiming to be affected by Force Majeure shall:

- i) promptly notify the other Parties of the occurrence and details of any event or circumstance said to give rise thereto and the estimated nature and extent of the delay in performance of its obligations under this GSA resulting there from; and
- ii) if the Force Majeure has caused damage to or destruction of any facilities, submit a plan for the repair or reinstatement thereof, provided that no Party shall be obliged to take such action by the provisions of this Article if in the reasonable opinion of such Party it would not be economic to do so.

23.4 The affected Party shall use all reasonable diligence to overcome or control the effect of the Force Majeure as quickly as possible, provided that the settlement of strikes, labour disputes, matters related to kidnapping, extortion or the like shall be at the sole discretion of the Party affected thereby and provided further that the affected Party shall not be obliged to incur expenditure to overcome the events or circumstances which caused the Force Majeure which would make it uneconomic for that Party to continue to be a Party to this GSA. Where a Party is prevented from performing an obligation under this GSA as a result of Force Majeure and such obligation is to be performed within a given time period, such time period shall be extended by the duration of the Force Majeure.

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24) ASSIGNMENT

24.1 Seller may sell, assign or otherwise transfer its interest under this GSA to a party to whom it may transfer or assign its interest under the Kandhkot Mining Lease and Kandhkot Additional Development & Production Lease, with the party having the technical and financial capability to perform such Seller's obligations under this GSA. Buyer may sell, assign or otherwise transfer any part of its interest in this GSA to a party with the technical and financial capability to perform Buyer's obligations hereunder this GSA.

25) CONFIDENTIALITY

25.1 The terms and conditions of this GSA and all information disclosed pursuant to this GSA shall be treated as confidential during the Term of this GSA and for five (5) years thereafter, and shall not be disclosed by the recipient without the prior written consent of the Party or Parties providing the relevant information, or without prior written consent of all the other Parties in the case of disclosure of the terms and conditions of this GSA. Notwithstanding the foregoing, any Party (the "Disclosing Party") may, without obtaining such prior written consent, disclose all or any such terms and conditions and/or information to the following persons:

- i) To the legal or financial advisers of the Disclosing Party;
- ii) To any Affiliate of the Disclosing Party;
- iii) To any bona fide intended transferee or assignee of the whole, or a significant part, of the issued share capital of the Disclosing Party or of the whole or part of the Disclosing Party's Working Interest under the Kandhkot Mining Lease and Kandhkot Additional Development & Production Lease or its interest under, or related to, this GSA (including, without prejudice to the generality of the foregoing, an interest in the Kandhkot Gas Field);
- iv) To any bank or financial institution, including the international lending agencies (Asian Development Bank, the World Bank, International Finance Corp, etc.), from whom the Disclosing Party is seeking or obtaining financing;
- v) To the extent required by law or the regulations of a recognized stock exchange;
- vi) To the extent required by the order of any Court having competent jurisdiction over the Disclosing Party;
- vii) To any person appointed as Expert and/or arbitrators pursuant to this GSA to the extent reasonably necessary for the performance of his duties; and

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viii) To any contractors (including professional consultants) engaged by the Disclosing Party; provided that it is a condition precedent to such disclosure to persons listed in:

- a) paragraphs i) and ii) above, that the Disclosing Party procures that such persons keep the information disclosed strictly confidential; and
- b) paragraphs iii), iv), vii) and viii) above, that such persons enter into an agreement with the Disclosing Party that the information disclosed will be kept strictly confidential. The Disclosing Party shall use all reasonable endeavours to enforce all such agreements, failing which the Disclosing Party shall be liable for the loss suffered by the other Parties for wrongful disclosure by such persons.

26) GAS DEHYDRATION

26.1 The Seller reserves the right to dehydrate the Gas from the Kandhkot Gas Field upstream of the Delivery Point for the purpose of delivering Dehydrated Specification Gas to the Buyer.

27) EXPERT

27.1 If any dispute arises between the between the Parties, which cannot be amicably resolved and which is of an essential technical nature regarding professional judgements pertaining to quantities, qualities, measurements, reserves, interest or exchange rates (hereinafter referred to as "Technical Dispute"), then an Expert shall be appointed and the dispute shall be resolved in the following manner:

- i) Any Party to the dispute may give written notice to the other Party stating it wishes a Technical Dispute to be referred to an Expert named in such notice and, in the same notice, shall request the other such Party to join with the Party giving the notice in appointing such named person(s) as a single Expert to resolve the Technical Dispute. The Parties shall use reasonable endeavours to engage an Expert who shall be resident in Pakistan.
- ii) If, within thirty (30) Days after giving such notice, the Parties to the dispute have been unable to agree on a single Expert, then the Expert shall be appointed by the Chairman Pakistan Engineering Council at the request of any party to the dispute made within ten (10) Days of the date of expiry of the aforementioned thirty (30) Days period.
- iii) The Expert who may be an individual, association, partnership or corporation, as the case may be, shall be well recognized as an Expert in the material field of knowledge or skill and shall be independent and/or exhibit no past or present relationship with any Party to the dispute and shall not be (or have previously been) an employee, consultant, contractor, or agent of any Party to such dispute;
- iv) The Expert shall be entitled to seek such assistance, as he deems necessary to reach his determination.

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- v) Before determining the Technical Dispute in question, the Expert shall give all the Parties to the dispute the opportunity of making written representations to him, which shall be copied to the other Parties. The Expert shall determine the Technical Dispute in question, by giving written reasons for his decision, within ninety (90) Days after his appointment or by such later date as may be mutually agreed by the Parties to the dispute. The Expert's determinations shall be conclusive and binding on all the Parties and not subject to appeal to any court, save in case of fraud or material and relevant mistake of fact.
- vi) If any Expert duly appointed in accordance this Article 27 becomes unwilling or unable to act, or does not in fact act, in the matter for which he is appointed, then another Expert shall be appointed in accordance with the procedure set out hereinabove.
- vii) The costs and expenses of an Expert appointed pursuant to this Article 27 shall be borne equally by the Parties to the Technical Dispute. An Expert appointed pursuant to this Article 27 shall act as an Expert and not as an arbitrator and the provisions of law relating to arbitration shall not apply to such Expert and/or to his decision and/or to the procedure by which his decision is reached.
- viii) Recourse to an Expert shall not have any suspensive effect on the application of this GSA.

28) ARBITRATION

- 28.1 In the event of any question or difference or dispute whatsoever arising between the Parties under or in connection with this GSA or any Article or provision herein contained or its constructions hereof, or as to any matter in any way connected therewith or arising there from which cannot be amicably settled and which is not a Technical Dispute, the same shall be referred to arbitration and finally settled in the following manner:
- i) The question, difference or dispute, as the case may be, shall be finally settled in accordance with the rules of Pakistan Arbitration Act 1940 by three (3) arbitrators or, in case the amount under question, difference or dispute is likely to be less than Pakistan Rupee fifteen million (Rs. 15.00 Million), by one (1) arbitrator) appointed in accordance with the Pakistan Arbitration Act 1940;
 - ii) The arbitrator(s) shall not be (or have previously been) employee(s), consultant(s), contractor(s), or agent(s) of any Party to the proceedings and shall be independent and/or exhibit no past or present relationship with any Party to the proceedings;
 - iii) The language shall be English and the venue of the arbitration shall be Karachi, Pakistan;

[Handwritten signatures]

- iv) The decision of the arbitrators shall be final and binding on the Parties who shall give full effect thereto and any judgment may be entered upon the award in any competent court in Karachi;
- v) Each Party shall bear in full its own costs in respect of its arbitrators' fee and legal costs of its own representation, in connection with any arbitration proceedings.
- vi) Recourse to Arbitration shall not have any suspensive effect on the application of this GSA.

29) INDEMNITIES

29.1 Seller shall indemnify and hold harmless Buyer from and against any and all claims by either Seller or any third parties for damages or losses of whatever nature which may occur upstream of the Delivery Point which arise out of or which are in any way connected with the design, engineering, construction or operation of the Seller's Facilities regardless of the cause of any such events.

29.2 Buyer shall indemnify and hold harmless Seller from and against any and all claims by either Buyer or any third parties for damages or losses of whatever nature which may occur downstream of the Delivery Point which arise out of or are in any way connected with the design, engineering, construction or operation of the Buyer's Facilities and/or the Check Measurement Facilities regardless of the cause of any such events.

30) CONSEQUENTIAL LOSS

30.1 No Party shall be liable to any other Party in respect of any consequential loss or damage suffered by any other such Party howsoever caused, whether or not due to the negligence of a Party, including loss of profit, product, contract or revenue.

31) TERMINATION

31.1 This GSA shall, subject to Article 22, terminate on the expiry of the lease life period of Kandhkot Gas Field unless earlier terminated in accordance with the provisions of this GSA;

31.2 On termination of this GSA, the rights and obligations of the Parties shall cease but the termination shall not affect any right of action existing or liabilities incurred by a Party before the date of termination and any arbitration proceeding which might have been commenced against a Party or may be continuing against it.

31.3 The validity of this GSA may be extended with mutual consent of the Seller and the Buyer.

Shi. A.D.

32) NOTICES

- 32.1** All notices under this GSA shall be in writing and shall be given at such addresses as the Parties shall specify from time to time by written notice to other Parties. Subject to any change in the respective addresses, notices shall be given at the following addresses:

PAKISTAN PETROLEUM LIMITED
For the attention of the General Manager, Kandhkot Asset
PIDC House, Dr. Ziauddin Ahmed Road,
P.O. Box No. 3942, Karachi, Pakistan
Tel: (021) 35651480-89, Fax: (021) 3568-0005, 3568-2125

CENTRAL POWER GENERATION COMPANY LIMITED (GENCO II)
For the attention of the Chief Executive Officer
Thermal Power Station Guddu
District Kashmore, Pakistan
Tel (0722) 579088 Fax (0722) 578328

- 32.2** Notice shall be deemed to have been received in accordance with the following:

- i) If delivered by hand or courier, at the time of delivery;
- ii) If sent by fax, at the time of transmission as evidenced by the automatic confirmation of such transmission.

- 32.3** If the time of such receipt is not between 10:00 a.m. and 4:00 p.m. (1600 hours) during a Business Day, Notice shall be deemed to have been received at 10.00 a.m. on the first Business Day thereafter.

33) LAW

- 33.1** This GSA will be subject to and construed in accordance with the laws of the Islamic Republic of Pakistan.

34) SEVERABILITY

- 34.1** Each of the rights and obligations contained in this GSA shall be deemed to be distinct and severable terms to the intent that if one or more of such rights and obligations shall be or be declared or become illegal, void or unenforceable, then the remaining rights and obligations shall (unless the effect is to frustrate the fundamental basis of this GSA) continue in force and effect.

- 34.2** Where a right and obligation is or has been declared or becomes illegal, void or unenforceable and the effect thereof is not to frustrate the fundamental basis of this GSA, the Parties agree to meet as soon as possible with a view to agreeing alternative arrangements, if possible, which will most closely conform to the right and obligation which has become or has been declared illegal, void or unenforceable.

Li R.D.

35) AMENDMENTS

35.1 All amendments to this GSA shall be in writing and signed by all the Parties.

36) HEADINGS

36.1 The headings in this GSA are used for convenience only and shall not affect the construction or validity of this GSA.

37) WARRANTIES

37.1 Buyer and Seller shall provide all data required under this GSA in good faith to the other party, provided however that the provision of such data (except for data pertaining to Monthly Invoice, Annual Reconciliation and the report detailing all C6+ components) does not constitute a warranty, express or implied, as to the accuracy, completeness or usefulness of the data provided and neither Buyer nor Seller accepts any liability or responsibility for the consequences of the other Party's use of such data.

38) ENTIRE AGREEMENT

38.1 This GSA together with the Schedule represent the entire agreement of all the Parties with respect to the matters covered herein.

SA *SA*

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IN WITNESS WHEREOF the Parties have signed this GSA as of the day and year first written above.

1. FOR AND ON BEHALF OF PAKISTAN PETROLEUM LIMITED (SELLER)

By: [Signature] S. Wamiq Bakhar

Title: MD & CEO

Witness No. 1: [Signature] G. Farooq Mawla GM (Kandhkot Asset)

Witness No. 2: [Signature] Sohaib Qadar GM Legal & Commercial

2. FOR AND ON BEHALF OF CENTRAL POWER GENERATION COMPANY LIMITED (BUYER)

By: [Signature]

Title: CEO CPGL

Witness No. 1: [Signature] Ruzaim Ali Chauri Mgr (FEC)

Witness No. 2: [Signature] Rizwan Fuz Muhammad

[Handwritten initials]

SCHEDULE-1:**SPECIFICATION GAS**

Gas delivered under this GSA shall have the following specifications at the Delivery Point, provided however that Gas delivered which deviates from the Gas Specifications for a total period not exceeding four (4) hours on any Day shall be deemed Specification Gas and any such Gas delivered thereafter shall be Off-Specification Gas;

- i) Purity: be commercially free from foreign materials and dust, or other solid or liquid matter, or waxes, gums and gum forming constituents which might cause interference with the proper operation of the Buyer's Facilities; and
- ii) Water Content: have a water content not greater than seven (7) pounds per MMscf at Atmospheric Pressure; and
- iii) Sulphur: contain not more than twenty (20) grains of total Sulphur per hundred (100) scf and
- iv) Hydrogen Sulphide: Hydrogen Sulphide (H₂S) concentration may vary up to forty (40) grains per 100 scf and
- v) Carbon Dioxide: contain not more than ten mole percent (10% mole) of Carbon Dioxide; and
- vi) Oxygen: contain not more than one mole percent (1.0% mole) of Oxygen; and
- vii) Gross Calorific Value: have a Gross Calorific Value not less than seven hundred and twenty five (725) Btu per scf; and
- viii) Temperature: have a temperature, which is not more than one hundred and forty (140) degrees Fahrenheit.

pd.

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ANNEX-O

OPERATIONAL RECORDS

OPERATIONAL RECORD FOR LAST FIVE YEARS FOR 747 MW CCPP GUDDU

Financial Year	Gross Generation (KWH)	Net Generation (KWH)	Efficiency (%)	Availability Factor (%)	Utilization Factor (%)	Load Factor (%)
2017-18	4,004,869,184	3,929,974,442	48.50	76.06	62.24	58.34
2018-19	5,186,278,143	5,069,775,624	52.96	90.32	80.29	72.52
2019-20	4,417,223,472	4,315,353,000	52.11	86.44	68.16	61.8
2020-21	3,201,803,708	3,123,820,001	48.52	69.92	48.93	47.67
2021-22	2,686,661,974	2,609,945,001	49.06	57.07	41.06	49.66

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MONTHLY ENVIRONMENTAL ASSESSMENT CHECKS LIST"

PERFORMA"

747 MW, CCPP, CPGCL, GENCO-II, GUDDU, MARCH -2019

260

Sr. No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material		Quantity	
				HRSG I	HRSG II
01	Fuel Usage	Natural Gas	Mcf		
02	Stack Emission	i. O ₂	%	13.02	13.2
		ii. CO	ppm	0.00	2.0
		iii. CO ₂	ppm	4.52	4.3
		iv. NOx	ppm	21.8	15.
		v. Sox	ppm	0	0
		vi. Temp	°C	124.9	118.
03	Water Usage	WATER TREATMENT PLANTS			
04	Liquid Effluent	i. Demi Plant's (Regeneration process) Neutralizing pit		1700 m ³	
		ii. Clarifier Drain		Nil	
		GTs & HRSGs			
		i. Sampling Rack Drain		Approx.: 1500m ³	
		ii. CCCW System (Close Loop.) Drain		Nil	
		iii. Boiler Blow Down (Main Plant Drain Pit)		Nil	
		iv. Condenser Blow Down (Close Cycle)		Nil	
		05	Solid Waste (Pertain to Civil Dept:)	i. Sludge Material (WWTP & Clarification Treatment Facilities)	
ii. Operation Trash, Garbage & Cotton Rags				-	
06	Employees Occupational Health	• Satisfactory			
07	Disposal Methods	• Waste Water Effluent Discharged after Neutralization / Treatment.			
08	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)			
09	MISCELLANEOUS FACATORS.				
	i. Spillage of Acid at Demi Plant		Nil		
	ii. Spillage of Caustic at Demi Plant		Nil		
	iii. Spillage of Acid/ Hypo at Cooling Tower		Nil		
	iv. Spillage of Oil		Nil		

Note:-

Waste water of Power Station includes:-

- 99.9% River Water used for Turbine Condenser (Primary Cooling)
- 0.1% Water Treatment Plant and Boiler Blow down Effluent

(Signature)
05/04/19
Environmental Supervisor
747 MW CCPP, CPGCL

(Signature)
Senior Environmental Officer
747 MW CCPP, CPGCL

SOUND LEVEL (dB) OF AT 747MW, CCPP (March 2019)

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	54		
02	PLC Room (Chemical Section)	48		
03	Work Shop	54		
04	Hydrogen Plant	64		
05	Gas Mixing Station Left side(100m) of Turbine Hall	90		
06	Entrance Gate # 5	61		
07	Hot Water Boiler	70		
08	HSD Tank's Area (Boundary Wall)	-		
09	Gas Conditioning Skid	78	80.7	
10	Turbine Hall gate b/w HRSG 1&2	89.6		
*11	Turbine Generator coupling	102	102	96
*12	Generator Exciter	99	105	92
*13	Turbine Compartment Compressor	103	105	-
*14	Combustion Chamber	108	110	
15	Basement	92		
16	Condensate Pump	93		
17	Turbine Hall	90		
18	Turbine Front ST-16	89		
19	Center Control Room	54.1		
20	ECR	54		
21	Chemical Pump House	76		
22	Fire Fighting Pumps Room	62		
23	Main Pump House	95		
24	Plant Manager /Admin Office	57		
25	Security Post Gate # 4	-		
26	Cooling Tower Area	74		
27	Right side(100m) of Turbine Hall (Near Training Center)	64		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	64		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	66		

Note: - * Enclosed Area
Please use Noise Protective Devices in High Noise areas.

(Signature)
08/04/19
Environmental Supervisor
747 MW CCPP, CPGCL

(Signature)
08/04/19
Senior Environmental Officer,
747 MW CCPP, CPGCL

CHEMICAL ANALYSIS OF EFFLUENT (OUT FALL STREAM)
747 MW,CCPP, GUDDU

Date	Sample	Temp:	pH	TDS	TSS	Iron	Chloride	Chlorine	COD
-	-	°C	-	ppm	ppm	ppb	ppm	ppm	ppm
26-03-2019	Out fall Stream	28	8.45	3255	152	0.19	970	0.90	6.42

Note:-

- ◇ TSS of Waste Water is directly related to the Turbidity of River Water.
- ◇ Waste water of Power Station includes:-
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent

P. Singh
08/04/19
Environmental Supervisor
747 MW CCPP, CPGCL

[Signature]
08/04/19
Senior Environmental Officer
747 MW CCPP, CPGCL

**MONTHLY ENVIRONMENTAL ASSESSMENT CHECKS LIST"
PERFORMA"**

747 MW, CCPP, CPGCL, GENCO-II, GUDDU, FEBRUARY -2019

263

Sr. No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material		Quantity	
				HRSG I	HRSG II
01	Fuel Usage	Natural Gas	Mcft		
02	Stack Emission	i. O ₂	%	14.29	13.14
		ii. CO	ppm	0.00	1.00
		iii. CO ₂	ppm	3.52	4.15
		iv. NO _x	ppm	19.6	13.3
		v. Sox	ppm	1.0	1.0
		vi. Temp	°C	118.3	113.8
03	Water Usage	WATER TREATMENT PLANTS			
04	Liquid Effluent	i. Demi Plant's (Regeneration process) Neutralizing pit		1700 m ³	
		ii. Clarifier Drain		Nil	
		GTs & HRSGs			
		i. Sampling Rack Drain		Approx.: 1500m ³	
		ii. CCCW System (Close Loop.) Drain		Nil	
		iii. Boiler Blow Down (Main Plant Drain Pit)		Nil	
05	Solid Waste (Pertain to Civil Dept:)	i. Sludge Material (WWTP & Clarification Treatment Facilities)		-	
		ii. Operation Trash, Garbage & Cotton Rags		-	
06	Employees Occupational Health	• Satisfactory			
07	Disposal Methods	• Waste Water Effluent Discharged after Neutralization / Treatment.			
08	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)			
09	MISCELLANEOUS FACATORS.				
	i. Spillage of Acid at Demi Plant			Nil	
	ii. Spillage of Caustic at Demi Plant			Nil	
	iii. Spillage of Acid/ Hypo at Cooling Tower			Nil	
	iv. Spillage of Oil			Nil	

Note:-

Waste water of Power Station includes:-

- 99.9% River Water used for Turbine Condenser (Primary Cooling)
- 0.1% Water Treatment Plant and Boiler Blow down Effluent

P. P. P. P.
24/03/19
Environmental Supervisor
747 MW CCPP, CPGCL

P. P. P. P.
04/03/19
Senior Environmental Officer
747 MW CCPP, CPGCL

SOUND LEVEL (dB) OF AT 747MW, CCPP (February 2019)

264

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	72.8		
02	PLC Room (Chemical Section)	61.2		
03	Work Shop	-		
04	Hydrogen Plant	59.1		
05	Gas Mixing Station Left side(100m) of Turbine Hall	62.3		
06	Entrance Gate # 5	-		
07	Hot Water Boiler	-		
08	HSD Tank's Area (Boundary Wall)	75.4		
09	Gas Conditioning Skid	64.3		
10	Turbine Hall gate b/w HRSG 1&2	89.6		
*11	Turbine Generator coupling	106	103	94.5
*12	Generator Exciter	92	91.5	90.8
*13	Turbine Compartment Compressor	103	104	
*14	Combustion Chamber	106	109.5	
15	Basement	90		
16	Condensate Pump	90		
17	Turbine Hall	91		
18	Turbine Front ST-16	86.5		
19	Center Control Room	62.0		
20	ECR	-		
21	Chemical Pump House	82		
22	Fire Fighting Pumps Room	80		
23	Main Pump House	85.4		
24	Plant Manager /Admin Office	56		
25	Security Post Gate # 4	-		
26	Cooling Tower Area	89.5		
27	Right side(100m) of Turbine Hall (Near Training Center)	76.4		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	76.0		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	77.5		

Note: - * Enclosed Area
Please use Noise Protective Devices in High Noise areas.

P. Singh
04/03/19
Environmental Supervisor
747 MW CCPP, CPGCL

P. Singh
04/03/19
Senior Environmental Officer
747 MW CCPP, CPGCL

CHEMICAL ANALYSIS OF EFFLUENT (OUT FALL STREAM)
747 MW,CCPP, GUDDU

Date	Sample	Temp:	pH	TDS	TSS	Iron	Chloride	Chlorine	COD
-	-	^o C	-	ppm	ppm	ppb	ppm	ppm	ppm
27-02-2018	Out fall Stream	28	8.58	3140	179	0.20	974	0.88	7.25

Note:-

- ◇ TSS of Waste Water is directly related to the Turbidity of River Water.
- ◇ Waste water of Power Station includes:-
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent

Pradeep
04/03/19
Environmental Supervisor
747 MW CCPP, CPGCL

Pradeep
04/03/19
Senior Environmental Officer
747 MW CCPP, CPGCL

265

**MONTHLY ENVIRONMENTAL ASSESSMENT CHECKS LIST"
PERFORMA"**

747 MW, CCPP, CPGCL, GENCO-II, GUDDU, APRIL -2019

266

Sr. No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material		Quantity	
				HRSG I	HRSG II
01	Stack Emission	i. O ₂	%	13.13	13.22
		ii. CO	ppm	0	1
		iii. CO ₂	ppm	4.46	4.41
		iv. NO _x	ppm	23	20
		v. Sox	ppm	0	0
		vi. Temp	°C	117.2	116.9
02	Water Usage	WATER TREATMENT PLANTS			
03	Liquid Effluent	i. Demi Plant's (Regeneration process) Neutralizing pit		2050m ³	
		ii. Clarifier Drain		Nil	
		GTs & HRSGs			
		i. Sampling Rack Drain		Approx.: 1500 m ³	
		ii. CCCW System (Close Loop.) Drain		Nil	
		iii. Boiler Blow Down (Main Plant Drain Pit)		Nil	
04	Solid Waste (Pertain to Civil Dept:)	i. Sludge Material (WWTP & Clarification Treatment Facilities)		-	
		ii. Operation Trash, Garbage & Cotton Rags		-	
05	Employees Occupational Health	• Satisfactory			
06	Disposal Methods	• Waste Water Effluent Discharged after Neutralization / Treatment.			
07	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)			
08	MISCELLANEOUS FACATORS.				
	i. Spillage of Acid at Demi Plant			Nil	
	ii. Spillage of Caustic at Demi Plant			Nil	
	iii. Spillage of Acid/ Hypo at Cooling Tower			Nil	
	iv. Spillage of Oil			Nil	

Note:-

Waste water of Power Station includes:-

- 99.9% River Water used for Turbine Condenser (Primary Cooling)
- 0.1% Water Treatment Plant and Boiler Blow down Effluent

Handwritten Signature
29/05/19
Environmental Supervisor
747 MW CCPP, CPGCL

Handwritten Signature
Senior Environmental Officer
747 MW CCPP, CPGCL

SOUND LEVEL (dB) OF AT 747MW, CCPP (April 2019)

267

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	53		
02	PLC Room (Chemical Section)	49		
03	Work Shop	54		
04	Hydrogen Plant	66		
05	Gas Mixing Station Left side(100m) of Turbine Hall	92		
06	Entrance Gate # 5	64		
07	Hot Water Boiler	70		
08	HSD Tank's Area (Boundary Wall)	68		
09	Gas Conditioning Skid	80	82	
10	Turbine Hall gate b/w HRSG 1&2	88.7		
*11	Turbine Generator coupling	101	102	95
*12	Generator Exciter	99	103	94
*13	Turbine Compartment Compressor	102	105	-
*14	Combustion Chamber	106	110	-
15	Basement	92		
16	Condensate Pump	94		
17	Turbine Hall	90		
18	Turbine Front ST-16	88		
19	Center Control Room	56		
20	ECR	53		
21	Chemical Pump House	76		
22	Fire Fighting Pumps Room	65		
23	Main Pump House	94		
24	Plant Manager /Admin Office	56		
25	Security Post Gate # 4	64		
26	Cooling Tower Area	76		
27	Right side(100m) of Turbine Hall (Near Training Center)	62		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	63		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	66		

Note: - * Enclosed Area
Please use Noise Protective Devices in High Noise areas.

P. Patel
09/05/19
Environmental Supervisor
747 MW CCPP, CPGCL

Rajesh Bajaj
Senior Environmental Officer
747 MW CCPP, CPGCL

CHEMICAL ANALYSIS OF EFFLUENT (OUT FALL STREAM)
747 MW,CCPP, GUDDU

Date	Sample	Temp:	pH	TDS	TSS	Iron	Chloride	Chlorine	COD
-	-	^o C	-	ppm	ppm	ppb	ppm	ppm	ppm
April 2019	Out fall	30	8.4	3190	142	0.25	894	0.90	6.56

Note:-

- ◇ TSS of Waste Water is directly related to the Turbidity of River Water.
- ◇ Waste water of Power Station includes:-
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent

P. Singh
09/05/19
Environmental Supervisor
747 MW CCPP, CPGCL

Sh. J. Jafar
Senior Environmental Officer
747 MW CCPP, CPGCL

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MONTHLY ENVIRONMENTAL ASSESSMENT CHECKS LIST

PERFORMA

747 MW, CAPP, CPGCL, GENCO-II, GUDDU, MAY- 2019

269

Sr. No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material		Quantity	
				HRSG I	HRSG II
01	Stack Emission	i. O ₂	%	13.10	13.0
		ii. CO	ppm	0	0
		iii. CO ₂	ppm	4.48	4.54
		iv. NOx	ppm	22	18
		v. Sox	ppm	0	0
		vi. Temp	°C	118	120
02	Water Usage	WATER TREATMENT PLANTS			
03	Liquid Effluent	i. Demi Plant's (Regeneration process) Neutralizing pit		2350 m ³	
		ii. Clarifier Drain		Nil	
		GTs & HRSGs			
		i. Sampling Rack Drain		Approx.: 1500 m ³	
		ii. CCCW System (Close Loop.) Drain		Nil	
		iii. Boiler Blow Down (Main Plant Drain Pit)		Nil	
04	Solid Waste (Pertain to Civil Dept.)	i. Sludge Material (WWTP & Clarification Treatment Facilities)		-	
		ii. Operation Trash, Garbage & Cotton Rags		-	
05	Employees Occupational Health	• Satisfactory			
06	Disposal Methods	• Waste Water Effluent Discharged after Neutralization / Treatment.			
07	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)			
08	MISCELLANEOUS FACATORS.				
	i. Spillage of Acid at Demi Plant			Nil	
	ii. Spillage of Caustic at Demi Plant			Nil	
	iii. Spillage of Acid/ Hypo at Cooling Tower			Nil	
	iv. Spillage of Oil			Nil	

Note:-

Waste water of Power Station includes:-

- 99.9% River Water used for Turbine Condenser (Primary Cooling)
- 0.1% Water Treatment Plant and Boiler Blow down Effluent.

P. P. H. H.
23/06/19
Environmental Supervisor
747 MW CAPP, CPGCL

S. S. S. S.
23/06/19
Senior Environmental Officer
747 MW CAPP, CPGCL

SOUND LEVEL (dB) OF AT 747MW, CCPP (May-2019)

270

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	56		
02	PLC Room (Chemical Section)	54		
03	Work Shop	60		
04	Hydrogen Plant	68		
05	Gas Mixing Station Left side(100m) of Turbine Hall	92		
06	Entrance Gate # 5	66		
07	Hot Water Boiler	68		
08	HSD Tank's Area (Boundary Wall)	68		
09	Gas Conditioning Skid	82	82	
10	Turbine Hall gate b/w HRSG 1&2	89		
*11	Turbine Generator coupling	101	102	95
*12	Generator Exciter	99	103	94
*13	Turbine Compartment Compressor	102	105	-
*14	Combustion Chamber	106	110	-
15	Basement	90		
16	Condensate Pump	95		
17	Turbine Hall	92		
18	Turbine Front ST-16	88		
19	Center Control Room	58		
20	ECR	54		
21	Chemical Pump House	74		
22	Fire Fighting Pumps Room	66		
23	Main Pump House	92		
24	Plant Manager /Admin Office	58		
25	Security Post Gate # 4	64		
26	Cooling Tower Area	78		
27	Right side(100m) of Turbine Hall (Near Training Center)	63		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	63		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	66		

Note: - * Enclosed Area
Please use Noise Protective Devices in High Noise areas.

Praveen
03/06/19
Environmental Supervisor
747 MW CCPP, CPGCL


S. J. Khan
03/06/19
Senior Environmental Officer
747 MW CCPP, CPGCL

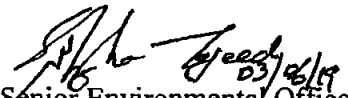
CHEMICAL ANALYSIS OF EFFLUENT (OUT FALL STREAM)
747 MW,CCPP, GUDDU

Date	Sample	Temp:	pH	TDS	TSS	Iron	Chloride	Chlorine	COD
-	-	^o C	-	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
May 2019	Out fall	34	8.61	3360	148	0.087	998	0.92	3.96

Note:-

- ◇ TSS of Waste Water is directly related to the Turbidity of River Water.
- ◇ Waste water of Power Station includes:-
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent


 03/06/19
 Environmental Supervisor
 747 MW CCPP, CPGCL


 03/06/19
 Senior Environmental Officer
 747 MW CCPP, CPGCL

271

MONTHLY ENVIRONMENTAL ASSESSMENT CHECKS LIST

PERFORMA

747 MW, CCPP, CPGCL, GENCO-II, GUDDU, JUNE- 2019

272

Sr. No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material		Quantity	
				HRSG I	HRSG II
01	Stack Emission	i. O ₂	%	13.41	13.26
		ii. CO	ppm	0	0
		iii. CO ₂	ppm	4.30	4.39
		iv. NO _x	ppm	19	15
		v. Sox	ppm	0	0
		vi. Temp	°C	122	123
02	Water Usage	WATER TREATMENT PLANTS			
03	Liquid Effluent	i. Demi Plant's (Regeneration process) Neutralizing pit		2350m ³	
		ii. Clarifier Drain		Nil	
		GTs & HRSGs			
		i. Sampling Rack Drain		Approx.: 1500 m ³	
		ii. CCCW System (Close Loop.) Drain		Nil	
		iii. Boiler Blow Down (Main Plant Drain.Pit)		Nil	
04	Solid Waste (Pertain to Civil Dept:)	i. Sludge Material (WWTP & Clarification Treatment Facilities)		-	
		ii. Operation Trash, Garbage & Cotton Rags		-	
05	Employees Occupational Health	• Satisfactory			
06	Disposal Methods	• Waste Water Effluent Discharged after Neutralization / Treatment.			
07	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)			
08	MISCELLANEOUS FACATORS.				
	i. Spillage of Acid at Demi Plant			Nil	
	ii. Spillage of Caustic at Demi Plant			Nil	
	iii. Spillage of Acid/ Hypo at Cooling Tower			Nil	
	iv. Spillage of Oil			Nil	

Note:-

Waste water of Power Station includes:-

- 99.9% River Water used for Turbine Condenser (Primary Cooling)
- 0.1% Water Treatment Plant and Boiler Blow down Effluent.

Handwritten Signature
 Environmental Supervisor
 747 MW CCPP, CPGCL

Handwritten Signature
 Senior Environmental Officer
 747 MW CCPP, CPGCL

SOUND LEVEL (dB) OF AT 747MW, CCPP (June-2019)

273

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	58		
02	PLC Room (Chemical Section)	56		
03	Work Shop	61		
04	Hydrogen Plant	65		
05	Gas Mixing Station Left side(100m) of Turbine Hall	90		
06	Entrance Gate # 5	65		
07	Hot Water Boiler	66		
08	HSD Tank's Area (Boundary Wall)	69		
09	Gas Conditioning Skid	81	80	
10	Turbine Hall gate b/w HRSG 1&2	90		
*11	Turbine Generator coupling	102	103	96
*12	Generator Exciter	100	102	93
*13	Turbine Compartment Compressor	103	104	-
*14	Combustion Chamber	107	111	-
15	Basement	91		
16	Condensate Pump	94		
17	Turbine Hall	93		
18	Turbine Front ST-16	86		
19	Center Control Room	59		
20	ECR	56		
21	Chemical Pump House	75		
22	Fire Fighting Pumps Room	65		
23	Main Pump House	91		
24	Plant Manager /Admin Office	57		
25	Security Post Gate # 4	65		
26	Cooling Tower Area	76		
27	Right side(100m) of Turbine Hall (Near Training Center)	62		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	61		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	63		

Note: - * Enclosed Area
Please use Noise Protective Devices in High Noise areas.

Pinal
15/07/19
Environmental Supervisor
747 MW CCPP, CPGCL

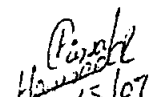
S. H. Javed
Senior Environmental Officer
747 MW CCPP, CPGCL

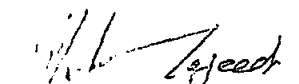
**CHEMICAL ANALYSIS OF EFFLUENT (OUT FALL) AND
747 MW,CCPP, GUDDU**

Date	Sample	Temp:	pH	TDS	TSS	Iron	Chloride	Fluoride	COD
		°C		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
June 2019	Out fall	35	8.54	1784	146	0.095			6.08

Note:-

- ◇ TSS of Waste Water is directly related to the Turbidity of River Water.
- ◇ Waste water of Power Station includes:-
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent


 15/07/19
 Environmental Supervisor
 747 MW CCPP, CPGCL


 Environmental Officer
 747 MW CCPP, CPGCL

274


275

Sr. No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material		Quantity	
				HRSG I	HRSG II
01	Stack Emission	i. O ₂	%	13.03	12.99
		ii. CO	ppm	0	1
		iii. CO ₂	ppm	4.52	4.54
		iv. NO _x	ppm	21	17
		v. Sox	ppm	0	0
		vi. Temp	°C	118.5	115.5
02	Water Usage	WATER TREATMENT PLANTS			
03	Liquid Effluent	i. Demi Plant's (Regeneration process) Neutralizing pit		2350m ³	
		ii. Clarifier Drain		Nil	
		CTs & HRSGs			
		i. Sampling Rack Drain		Approx.: 1500 m ³	
		ii. CCCW System (Close Loop.) Drain		Nil	
		iii. Boiler Blow Down (Main Plant Drain Pit)		Nil	
04	Solid Waste (Pertain to Civil Dept.)	i. Sludge Material (WWTP & Clarification Treatment Facilities)		-	
		ii. Operation Trash, Garbage & Cotton Rags		-	
05	Employees Occupational Health	• Satisfactory			
06	Disposal Methods	• Waste Water Effluent Discharged after Neutralization/- Treatment.			
07	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)			
08	MISCELLANEOUS FACATORS.				
		i. Spillage of Acid at Demi Plant		Nil	
		ii. - Spillage of Caustic at Demi Plant		Nil	
		iii. Spillage of Acid/ Hypo at Cooling Tower		Nil	
		iv. Spillage of Oil		Nil	

Note:-

Waste-water of Power Station includes:-

- 99.9% River Water used for Turbine Condenser (Primary Cooling)
- 0.1% Water Treatment Plant and Boiler Blow down Effluent.


 Senior Environmental Officer
 747 MW CCPP, CPGCL

SOUND LEVEL (dB) OF AT 747MW, CCPP (July-2019)

276

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	57		
02	PLC Room (Chemical Section)	58		
03	Work Shop	60		
04	Hydrogen Plant	61		
05	Gas Mixing Station Left side(100m) of Turbine Hall	91		
06	Entrance Gate # 5	64		
07	Hot Water Boiler	66		
08	HSD Tank's Area (Boundary Wall)	69		
09	Gas Conditioning Skid	80	79	
10	Turbine Hall gate b/w HRSG 1&2	89		
*11	Turbine Generator coupling	102	103	96
*12	Generator Exciter	101	103	94
*13	Turbine Compartment Compressor	105	103	-
*14	Combustion Chamber	109	110	-
15	Basement	91		
16	Condensate Pump	94		
17	Turbine Hall	93		
18	Turbine Front ST-16	86		
19	Center Control Room	59		
20	ECR	56		
21	Chemical Pump House	72		
22	Fire Fighting Pumps Room	65		
23	Main Pump House	90		
24	Plant Manager /Admin Office	55		
25	Security Post Gate # 4	65		
26	Cooling Tower Area	74		
27	Right side(100m) of Turbine Hall (Near Training Center)	62		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	61		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	63		

Note: -

* Enclosed Area

Please use Noise Protective Devices in High Noise areas.


J. P. Singh
 Senior Environmental Officer
 747 MW CCPP, CPGCL

CHEMICAL ANALYSIS OF EFFLUENT (OUT FALL STREAM)
747 MW,CCPP, GUDDU

Date	Sample	Temp:	pH	TDS	TSS	Iron	Chloride	Chlorine	COD
		^o C		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
July 2019	Out fall	34	8.26	240	142	0.086	23.08	0.03	6.24

Note:-

- ◇ TSS of Waste Water is directly related to the Turbidity of River Water.
- ◇ Waste water of Power Station includes:-
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent


Senior Environmental Officer
747 MW CCPP, CPGCL

(277)

MONTHLY ENVIRONMENTAL ASSESSMENT CHECKS LIST"

PERFORMA"

747 MW, CAPP, CPGCL, GENCO-II, GUDDU, AUGUST- 2019

278

Sr. No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material		Quantity	
				HRSG I	HRSG II
01	Stack Emission	i. O ₂	%	13.14	13.20
		ii. CO	ppm	0.0	1.0
		iii. CO ₂	ppm	4.45	4.42
		iv. NOx	ppm	19.0	15.0
		v. Sox	ppm	1.0	0.0
		vi. Temp	°C	116.0	117.3
02	Water Usage	WATER TREATMENT PLANTS			
03	Liquid Effluent	i. Demi Plant's (Regeneration process) Neutralizing pit		2700 m ³	
		ii. Clarifier Drain		Nil	
		GTs & HRSGs			
		i. Sampling Rack Drain		Approx.: 1500 m ³	
		ii. CCCW System (Close Loop.) Drain		Nil	
		iii. Boiler Blow Down (Main Plant Drain Pit)		Nil	
04	Solid Waste (Pertain to Civil Dept:)	i. Sludge Material (WWTP & Clarification Treatment Facilities)		-	
		ii. Operation Trash, Garbage & Cotton Rags		-	
05	Employees Occupational Health	• Satisfactory			
06	Disposal Methods	• Waste Water Effluent Discharged after Neutralization / Treatment.			
07	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)			
08	MISCELLANEOUS FACATORS.				
	i. Spillage of Acid at Demi Plant			Nil	
	ii. Spillage of Caustic at Demi Plant			Nil	
	iii. Spillage of Acid/ Hypo at Cooling Tower			Nil	
	iv. Spillage of Oil			Nil	

Note:-

Waste water of Power Station includes:-

- 99.9% River Water used for Turbine Condenser (Primary Cooling)
- 0.1% Water Treatment Plant and Boiler Blow down Effluent.

Pinal Hassan
16/09/19
Environmental Supervisor
747 MW CAPP, CPGCL

Abdul Qadeer
16/09/19
Senior Environmental Officer
747 MW CAPP, CPGCL

SOUND LEVEL (dB) OF AT 747MW, CCPP (AUGUST-2019)

279

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	74.5		
02	PLC Room (Chemical Section)	65		
03	Work Shop	63		
04	Hydrogen Plant	68		
05	Gas Mixing Station Left side(100m) of Turbine Hall	66		
06	Entrance Gate # 5	64		
07	Hot Water Boiler	63		
08	HSD Tank's Area (Boundary Wall)	64		
09	Gas Conditioning Skid	74	76	
10	Turbine Hall gate b/w HRSG 1&2	88		
*11	Turbine Generator coupling	102	101	95
*12	Generator Exciter	110	109	92
*13	Turbine Compartment Compressor	103	105	
*14	Combustion Chamber	105	108	
15	Basement	92		
16	Condensate Pump	93		
17	Turbine Hall	90		
18	Turbine Front ST-16	90		
19	Center Control Room	62		
20	ECR	48		
21	Chemical Pump House	84		
22	Fire Fighting Pumps Room	58		
23	Main Pump House	85		
24	Plant Manager /Admin Office	52		
25	Security Post Gate # 4	65		
26	Cooling Tower Area	73		
27	Right side(100m) of Turbine Hall (Near Training Center)	66		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	65		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	63		

Note: -* Enclosed Area

Please use Noise Protective Devices in High Noise areas.

Pisal
Harneed
 16/09/19
 Environmental Supervisor
 747 MW CCPP, CPGCL


J. S. Jaiswal
 16/09/19
 Senior Environmental Officer
 747 MW CCPP, CPGCL


CHEMICAL ANALYSIS OF EFFLUENT (OUT FALL STREAM)
747 MW,CCPP, GUDDU

Date	Sample	Temp:	pH	TDS	TSS	Iron	Chloride	Chlorine	COD
-	-	^o C	-	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
AUGUST 2019	Out fall	38	8.27	272	-	0.082	49.70	0.04	6.48

Note:-

- ◇ TSS of Waste Water is directly related to the Turbidity of River Water.
- ◇ Waste water of Power Station includes:-
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent


Environmental Supervisor
747 MW CCPP, CPGCL


Senior Environmental Officer
747 MW CCPP, CPGCL

280

MONTHLY ENVIRONMENTAL ASSESSMENT CHECKS LIST"
PERFORMA"

747 MW CAPP, CPGCL, GENCO-II, GUDDU, SEPTEMBER - 2019

281

Sr. No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material		Quantity	
				HRSG I	HRSG II
01	Stack Emission	i. O ₂	%	13.10	13.11
		ii. CO	ppm	00	01
		iii. CO ₂	ppm %	4.47	4.47
		iv. NOx	ppm	22	17
		v. Sox	ppm	0	0
		vi. Temp	°C	115.6	117.5
02	Water Usage	WATER TREATMENT PLANTS			
03	Liquid Effluent	i. Demi Plant's (Regeneration process) Neutralizing pit		1700 m ³	
		ii. Clarifier Drain		Nil	
		GTs & HRSGs			
		i. Sampling Rack Drain		Approx.: 1500 m ³	
		ii. CCCW System (Close Loop.) Drain		Nil	
		iii. Boiler Blow Down (Main Plant Drain Pit)		Nil	
04	Solid Waste (Pertain to Civil Dept.)	i. Sludge Material (WWTP & Clarification Treatment Facilities)		-	
		ii. Operation Trash, Garbage & Cotton Rags		-	
05	Employees Occupational Health	• Satisfactory			
06	Disposal Methods	• Waste Water Effluent Discharged after Neutralization / Treatment.			
07	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)			
08	MISCELLANEOUS FACATORS.				
	i. Spillage of Acid at Demi Plant		Nil		
	ii. Spillage of Caustic at Demi Plant		Nil		
	iii. Spillage of Acid/ Hypo at Cooling Tower		Nil		
	iv. Spillage of Oil		Nil		

Note:-

Waste water of Power Station includes:-

- 99.9% River Water used for Turbine Condenser (Primary Cooling)
- 0.1% Water Treatment Plant and Boiler Blow down Effluent.

P. Singh
04/10/19
Environmental Supervisor
747 MW CAPP, CPGCL

P. Singh
04/10/19
Senior Environmental Officer
747 MW CAPP, CPGCL

SOUND LEVEL (dB) OF AT 747MW, CCPP (SEPTEMBER-2019)

282

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	66.5		
02	PLC Room (Chemical Section)	64		
03	Work Shop	62		
04	Hydrogen Plant	63.6		
05	Gas Mixing Station Left side(100m) of Turbine Hall	67		
06	Entrance Gate # 5	69		
07	Hot Water Boiler	68		
08	HSD Tank's Area (Boundary Wall)	65		
09	Gas Conditioning Skid	74	78	
10	Turbine Hall gate b/w HRSG 1&2	90		
*11	Turbine Generator coupling	102	103	97
*12	Generator Exciter	111	110	95
*13	Turbine Compartment Compressor	104	105	
*14	Combustion Chamber	106	107	
15	Basement	93		
16	Condensate Pump	95		
17	Turbine Hall	90		
18	Turbine Front ST-16	89		
19	Center Control Room	64		
20	ECR	49		
21	Chemical Pump House	83		
22	Fire Fighting Pumps Room	57		
23	Main Pump House	86		
24	Plant Manager /Admin Office	51		
25	Security Post Gate # 4	58		
26	Cooling Tower Area	74		
27	Right side(100m) of Turbine Hall (Near Training Center)	67		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	64		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	65		

Note: -* Enclosed Area

Please use Noise Protective Devices in High Noise areas.

P. Singh
04/10/19
Environmental Supervisor
747 MW CCPP, CPGCL

f. P. Singh
04/10/19
Senior Environmental Officer
747 MW CCPP, CPGCL

CHEMICAL ANALYSIS OF EFFLUENT (OUT FALL STREAM)
747 MW,CCPP, GUDDU

Date	Sample	Temp:	pH	TDS	TSS	Iron	Chloride	Chlorine	COD
	-	^o C	-	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
SEPTEMBER 2019	Out fall	39	8.35	152	136	0.096	22.01	0.07	6.24

Note:-

- ◇ TSS of Waste Water is directly related to the Turbidity of River Water.
- ◇ Waste water of Power Station includes:-
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent

H. P. P. P.
04/10/19
 Environmental Supervisor
 747 MW CCPP, CPGCL

S. M. T. T.
 Senior Environmental Officer
 747 MW CCPP, CPGCL

283

MONTHLY ENVIRONMENTAL ASSESSMENT CHECKS LIST™

PERFORMA™

747 MW, CCPP, CPGCL, GENCO-II, GUDDU, OCTOBER - 2019

289

Sr. No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material		Quantity	
				HRSG I	HRSG II
01	Stack Emission	i. O ₂	%	13.15	13.13
		ii. CO	ppm	0	1
		iii. CO ₂	ppm %	4.45	4.46
		iv. NOx	ppm	21	17
		v. Sox	ppm	0	0
		vi. Temp	°C	114	118.6
02	Water Usage	WATER TREATMENT PLANTS			
03	Liquid Effluent	i. Demi Plant's (Regeneration process) Neutralizing pit		1200 m ³	
		ii. Clarifier Drain		Nil	
		GTs & HRSGs			
		i. Sampling Rack Drain		Approx.: 1500 m ³	
		ii. CCCW System (Close Loop.) Drain		Nil	
		iii. Boiler Blow Down (Main Plant Drain Pit)		Nil	
04	Solid Waste (Pertain to Civil Dept:)	i. Sludge Material (WWTP & Clarification Treatment Facilities)		-	
		ii. Operation Trash, Garbage & Cotton Rags		-	
05	Employees Occupational Health	• Satisfactory			
06	Disposal Methods	• Waste Water Effluent Discharged after Neutralization / Treatment.			
07	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)			
08	MISCELLANEOUS FACATORS.				
	i. Spillage of Acid at Demi Plant			Nil	
	ii. Spillage of Caustic at Demi Plant			Nil	
	iii. Spillage of Acid/ Hypo at Cooling Tower			Nil	
	iv. Spillage of Oil			Nil	

Note:-

Waste water of Power Station includes:-

- 99.9% River Water used for Turbine Condenser (Primary Cooling)
- 0.1% Water Treatment Plant and Boiler Blow down Effluent.

Coral Hassan
04/11/19
Environmental Supervisor
747 MW CCPP, CPGCL

Shah Javed
Senior Environmental Officer
747 MW CCPP, CPGCL

SOUND LEVEL (dB) OF AT 747MW, CCPP (OCTOBER-2019)

285

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	63.5		
02	PLC Room (Chemical Section)	69.2		
03	Work Shop	60.8		
04	Hydrogen Plant	61		
05	Gas Mixing Station Left side(100m) of Turbine Hall	65		
06	Entrance Gate # 5	65.8		
07	Hot Water Boiler	77.2		
08	HSD Tank's Area (Boundary Wall)	66.4		
09	Gas Conditioning Skid	77.2	81.4	
10	Turbine Hall gate b/w HRSG 1&2	86.8		
*11	Turbine Generator coupling	91.4	91.2	
*12	Generator Exciter	92.6	91.2	
*13	Turbine Compartment Compressor	116.8	117.6	
*14	Combustion Chamber	107	109	
15	Basement	92		
16	Condensate Pump	91.5		
17	Turbine Hall	90.6		
18	Turbine Front ST-16	88		
19	Center Control Room	60.3		
20	ECR	54		
21	Chemical Pump House	81.5		
22	Fire Fighting Pumps Room	54		
23	Main Pump House	81.5		
24	Plant Manager /Admin Office	51		
25	Security Post Gate # 4	62.6		
26	Cooling Tower Area	52.7		
27	Right side(100m) of Turbine Hall (Near Training Center)	69.1		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	66		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	63		

Note: -* Enclosed Area
Please use Noise Protective Devices in High Noise areas.

P. Singh
04/11/19
Environmental Supervisor
747 MW CCPP, CPGCL

P. Singh 04/11/19
Senior Environmental Officer
747 MW CCPP, CPGCL

CHEMICAL ANALYSIS OF EFFLUENT (OUT FALL STREAM)
747 MW,CCPP, GUBDU

Date	Sample	Temp:	pH	TDS	TSS	Iron	Chloride	Chlorine	COD
-	-	^o C	-	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
OCTOBER 2019	Out fall	31	8.14	213	142	0.092	29.82	0.07	6.22

Note:-

- ✧ TSS of Waste Water is directly related to the Turbidity of River Water.
- ✧ Waste water of Power Station includes:-
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent

[Handwritten Signature]
 04/11/19
 Environmental Supervisor
 747 MW CCPP, CPGCL

[Handwritten Signature]
 Senior Environmental Officer
 747 MW CCPP, CPGCL

**MONTHLY ENVIRONMENTAL ASSESSMENT CHECKS LIST"
PERFORMA"**

747 MW, CCPP, CPGCL, GENCO-II, GUDDU, NOVEMBER - 2019

287

Sr. No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material		Quantity	
				HRSG I	HRSG II
01	Stack Emission	i. O ₂	%	13.24	13.87
		ii. CO	ppm	0	8
		iii. CO ₂	%	4.40	4.04
		iv. NO _x	ppm	22	9
		v. Sox	ppm	0	0
		vi. Temp	°C	108	111
02	Water Usage	WATER TREATMENT PLANTS			
03	Liquid Effluent	i. Demi Plant's (Regeneration process) Neutralizing pit		900 m ³	
		ii. Clarifier Drain		Nil	
		GTs & HRSGs			
		i. Sampling Rack Drain		Approx.: 1000 m ³	
		ii. CCCW System (Close Loop.) Drain		Nil	
		iii. Boiler Blow Down (Main Plant Drain Pit)		Nil	
		iv. Condenser Blow Down (Close Cycle)		Nil	
04	Solid Waste (Pertain to Civil Dept:)	i. Sludge Material (WWTP & Clarification Treatment Facilities)		-	
		ii. Operation Trash, Garbage & Cotton Rags		-	
05	Employees Occupational Health	• Satisfactory			
06	Disposal Methods	• Waste Water Effluent Discharged after Neutralization / Treatment.			
07	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)			
08	MISCELLANEOUS FACATORS.				
	i. Spillage of Acid at Demi Plant		Nil		
	ii. Spillage of Caustic at Demi Plant		Nil		
	iii. Spillage of Acid/ Hypo at Cooling Tower		Nil		
	iv. Spillage of Oil		Nil		

Note:-

Waste water of Power Station includes:-

- 99.9% River Water used for Turbine Condenser (Primary Cooling)
- 0.1% Water Treatment Plant and Boiler Blow down Effluent.

Pamul
Harsh
05/12/19
Environmental Supervisor
747 MW CCPP, CPGCL

S. J. K.
Jeel
05/12/19
Senior Environmental Officer
747 MW CCPP, CPGCL

SOUND LEVEL (dB) OF AT 747MW, CCPP (November-2019)

288

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	64.2		
02	PLC Room (Chemical Section)	63		
03	Work Shop	64		
04	Hydrogen Plant	64		
05	Gas Mixing Station Left side(100m) of Turbine Hall	66		
06	Entrance Gate # 5	68		
07	Hot Water Boiler	67		
08	HSD Tank's Area (Boundary Wall)	66		
09	Gas Conditioning Skid	75	77	
10	Turbine Hall gate b/w HRSG 1&2	89		
*11	Turbine Generator coupling	103	104	98
*12	Generator Exciter	112	111	96
*13	Turbine Compartment Compressor	105	107	
*14	Combustion Chamber	107	106	
15	Basement	94		
16	Condensate Pump	94		
17	Turbine Hall	91		
18	Turbine Front ST-16	90		
19	Center Control Room	66		
20	ECR	48		
21	Chemical Pump House	84		
22	Fire Fighting Pumps Room	56		
23	Main Pump House	87		
24	Plant Manager /Admin Office	52		
25	Security Post Gate # 4	59		
26	Cooling Tower Area	75		
27	Right side(100m) of Turbine Hall (Near Training Center)	66		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	68		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	69		

Note: -* Enclosed Area

Please use Noise Protective Devices in High Noise areas.

Pirahat
Harsh
 05/12/19
 Environmental Supervisor
 747 MW CCPP, CPGCL

[Signature]
 05/12/19
 Senior Environmental Officer
 747 MW CCPP, CPGCL

CHEMICAL ANALYSIS OF EFFLUENT (OUT FALL)
747 MW,CCPP, GUDDU

Date	Sample	Temp: °C	pH	TDS mg/L	TSS mg/L	Iron mg/L	Chloride mg/L	Chlorine mg/L	OD mg/L
November 2019	Out fall	24	8.33	191	100	0.096	16.3	0.072	8.80

Note:-

- ◇ TSS of Waste Water is directly related to the Turbidity of River Water.
- ◇ Waste water of Power Station includes:-
 - Once through mode (Open Cycle)
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent

P. Singh
05/12/19
 Environmental Supervisor
 747 MW CCPP, CPGCL

P. Singh
 Senior Environmental Officer
 747 MW CCPP, CPGCL
05/12/19

289

MONTHLY ENVIRONMENTAL ASSESSMENT CHECKS LIST"

PERFORMA"

747 MW, CCPP, CPGCL, GENCO-II, GUDDU, DECEMBER- 2019

290

Sr. No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material		Quantity	
				HRSG I	HRSG II
01	Stack Emission	i. O ₂	%	13.22	13.67
		ii. CO	ppm	0	5
		iii. CO ₂	%	4.40	4.04
		iv. NOx	ppm	22	15
		v. Sox	ppm	0	0
		vi. Temp	°C	113	115
02	Water Usage	WATER TREATMENT PLANTS			
03	Liquid Effluent	i. Demi Plant's (Regeneration process) Neutralizing pit		800 m ³	
		ii. Clarifier Drain		Nil	
		GTs & HRSGs			
		i. Sampling Rack Drain		Approx.: 850 m ³	
		ii. CCCW System (Close Loop.) Drain		Nil	
		iii. Boiler Blow Down (Main Plant Drain Pit)		Nil	
iv. Condenser Blow Down (Close Cycle)		Nil			
04	Solid Waste (Pertain to Civil Dept:)	i. Sludge Material (WWTP & Clarification Treatment Facilities)		-	
		ii. Operation Trash, Garbage & Cotton Rags		-	
05	Employees Occupational Health	• Satisfactory			
06	Disposal Methods	• Waste Water Effluent Discharged after Neutralization / Treatment.			
07	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)			
08	MISCELLANEOUS FACATORS.				
	i. Spillage of Acid at Demi Plant			Nil	
	ii. Spillage of Caustic at Demi Plant			Nil	
	iii. Spillage of Acid/ Hypo at Cooling Tower			Nil	
	iv. Spillage of Oil			Nil	

Note:-

Waste water of Power Station includes:-

- 99.9% River Water used for Turbine Condenser (Primary Cooling)
- 0.1% Water Treatment Plant and Boiler Blow down Effluent.

[Signature]
31/12/19
Environmental Supervisor
747 MW CCPP, CPGCL

[Signature]
31/12/19
Senior Environmental Officer
747 MW CCPP, CPGCL

SOUND LEVEL (dB) OF AT 747MW, CCPP (December-2019)

291

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	62		
02	PLC Room (Chemical Section)	60		
03	Work Shop	59.4		
04	Hydrogen Plant	60		
05	Gas Mixing Station Left side(100m) of Turbine Hall	64.0		
06	Entrance Gate # 5	65		
07	Hot Water Boiler	65		
08	HSD Tank's Area (Boundary Wall)	65.4		
09	Gas Conditioning Skid	75	78	
10	Turbine Hall gate b/w HRSG 1&2	85		
*11	Turbine Generator coupling	103	92.3	92.4
*12	Generator Exciter	112	92.0	93.4
*13	Turbine Compartment Compressor	105	117	
*14	Combustion Chamber	107	107	
15	Basement	93.5		
16	Condensate Pump	94.2		
17	Turbine Hall	91		
18	Turbine Front ST-16	90		
19	Center Control Room	58.5		
20	ECR	48		
21	Chemical Pump House	82.5		
22	Fire Fighting Pumps Room	57.5		
23	Main Pump House	82.2		
24	Plant Manager /Admin Office	50		
25	Security Post Gate # 4	62.5		
26	Cooling Tower Area	50.7		
27	Right side(100m) of Turbine Hall (Near Training Center)	66.0		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	66.4		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	64.8		

Note: -* Enclosed Area

Please use Noise Protective Devices in High Noise areas.

P. Singh
31/12/19
Environmental Supervisor
747 MW CCPP, CPGCL

P. Singh
31/12/19
Senior Environmental Officer
747 MW CCPP, CPGCL

CHEMICAL ANALYSIS OF EFFLUENT (OUT FALL STREAM)

:- **747 MW,CCPP, GUDDU**

Date	Sample	Temp:	pH	TDS	TSS	Iron	Chloride	Chlorine	COD
-	-	^o C	-	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
December 2019	Out fall	22	8.12	199	220	0.086	17.04	0.074	9.02

Note:-

- ◇ TSS of Waste Water is directly related to the Turbidity of River Water.
- ◇ Waste water of Power Station includes:-
 - Once through mode (Open Cycle)
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent

Pirachi
31/12/19
Environmental Supervisor
747 MW CCPP, CPGCL

31/12/19
Senior Environmental Officer
747 MW CCPP, CPGCL

292

MONTHLY ENVIRONMENTAL ASSESSMENT CHECKS LIST

PERFORMA

747 MW, CCPP, CPGCL, GENCO-II, GUDDU, FEBUARY -2020

293

Sr. No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material		Quantity	
				HRSG I	HRSG II
01	Stack Emission	i. O ₂	%		13.19
		ii. CO	ppm		3.0
		iii. CO ₂	%		4.42
		iv. Nox	ppm		16.0
		v. Sox	ppm		0.0
		vi. Temp	°C		111.8
02	Water Usage	WATER TREATMENT PLANTS			
03	Liquid Effluent	i. Demi Plant's (Regeneration process) Neutralizing pit			700 m ³
		ii. Clarifier Drain			Nil
		GTs & HRSGs			
		i. Sampling Rack Drain			Approx.: 600 m ³
		ii. CCCW System (Close Loop.) Drain			Nil
		iii. Boiler Blow Down (Main Plant Drain Pit)			Nil
		iv. Condenser Blow Down (Close Cycle)			Nil
04	Solid Waste (Pertain to Civil Dept:)	i. Sludge Material (WWTP & Clarification Treatment Facilities)			-
		ii. Operation Trash, Garbage & Cotton Rags			-
05	Employees Occupational Health	• Satisfactory			
06	Disposal Methods	• Waste Water Effluent Discharged after Neutralization / Treatment.			
07	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)			
08	MISCELLANEOUS FACATORS.				
		i. Spillage of Acid at Demi Plant			Nil
		ii. Spillage of Caustic at Demi Plant			Nil
		iii. Spillage of Acid/ Hypo at Cooling Tower			Nil
		iv. Spillage of Oil			Nil

Note:-

Waste water of Power Station includes:-

- 99.9% River Water used for Turbine Condenser (Primary Cooling)
- 0.1% Water Treatment Plant and Boiler Blow down Effluent.

H. P. ...

Environmental Supervisor
747 MW CCPP, CPGCL

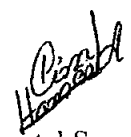
SOUND LEVEL (dB) OF AT 747MW, CCPP (February, 2020)

294

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	62		
02	PLC Room (Chemical Section)	58		
03	Work Shop	63		
04	Hydrogen Plant	60		
05	Gas Mixing Station Left side(100m) of Turbine Hall	75		
06	Entrance Gate # 5	64		
07	Hot Water Boiler	68		
08	HSD Tank's Area (Boundary Wall)	64		
09	Gas Conditioning Skid	65	80	
10	Turbine Hall gate b/w HRSG 1&2	83		
*11	Turbine Generator coupling	76	112	95
*12	Generator Exciter	82	94	92
*13	Turbine Compartment Compressor	82	104	
*14	Combustion Chamber	72	105	
15	Basement	85		
16	Condensate Pump	93		
17	Turbine Hall	88		
18	Turbine Front ST-16	86		
19	Center Control Room	58		
20	ECR	57		
21	Chemical Pump House	61		
22	Fire Fighting Pumps Room	59		
23	Main Pump House	63		
24	Plant Manager /Admin Office	50		
25	Security Post Gate # 4	55		
26	Cooling Tower Area	58		
27	Right side(100m) of Turbine Hall (Near Training Center)	68		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	70		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	68		

Note: -* Enclosed Area

Please use Noise Protective Devices in High Noise areas.



 Environmental Supervisor
 747 MW CCPP, CPGCL

CHEMICAL ANALYSIS OF EFFLUENT (OUT FALL STREAM)
747 MW,CCPP, GUDDU

Date	Sample	Temp:	pH	TDS	TSS	Iron	Chloride	Chlorine	COD	Sulphate	Ammonia
-	-	⁰ C	-	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
February - 2020	Out fall	24	8.6	250	275	0.086	27.69	0.074	8.16	55.0	0.258

Note:-

- ◇ TSS of Waste Water is directly related to the Turbidity of River Water.
- ◇ Waste water of Power Station includes:-
 - Once through mode (Open Cycle)
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent


Environmental Supervisor
747 MW CCPP, CPGCL

295

MONTHLY ENVIRONMENTAL ASSESSMENT CHECKS LIST"

PERFORMA"

747 MW, CCPP, CPGCL, GENCO-II, GUDDU, JANUARY-2020

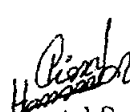
296

Sr. No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material		Quantity	
				HRSG I	HRSG II
01	Stack Emission	i. O ₂	%	13.26	13.05
		ii. CO	ppm	0	3.0
		iii. CO ₂	%	4.38	4.51
		iv. Nox	ppm	19	17
		v. Sox	ppm	0.0	0.0
		vi. Temp	°C	113.60	114.10
02	Water Usage	WATER TREATMENT PLANTS			
03	Liquid Effluent	i. Demi Plant's (Regeneration process) Neutralizing pit		900 m ³	
		ii. Clarifier Drain		Nil	
		GTs & HRSGs			
		i. Sampling Rack Drain		Approx.: 1200 m ³	
		ii. CCCW System (Close Loop.) Drain		Nil	
		iii. Boiler Blow Down (Main Plant Drain Pit)		Nil	
04	Solid Waste (Pertain to Civil Dept:)	iv. Condenser Blow Down (Close Cycle)		Nil	
		i. Sludge Material (WWTP & Clarification Treatment Facilities)		-	
04	Solid Waste (Pertain to Civil Dept:)	ii. Operation Trash, Garbage & Cotton Rags		-	
05	Employees Occupational Health	• Satisfactory			
06	Disposal Methods	• Waste Water Effluent Discharged after Neutralization / Treatment.			
07	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)			
08	MISCELLANEOUS FACATORS.				
	i. Spillage of Acid at Demi Plant			Nil	
	ii. Spillage of Caustic at Demi Plant			Nil	
	iii. Spillage of Acid/ Hypo at Cooling Tower			Nil	
	iv. Spillage of Oil			Nil	

Note:-

Waste water of Power Station includes:-

- 99.9% River Water used for Turbine Condenser (Primary Cooling)
- 0.1% Water Treatment Plant and Boiler Blow down Effluent.


 Environmental Supervisor
 747 MW CCPP, CPGCL


SOUND LEVEL (dB) OF AT 747MW, CCPP (January, 2020)

297

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	62		
02	PLC Room (Chemical Section)	58		
03	Work Shop	56.7		
04	Hydrogen Plant	57.0		
05	Gas Mixing Station Left side(100m) of Turbine Hall	66.0		
06	Entrance Gate # 5	67.3		
07	Hot Water Boiler	66.4		
08	HSD Tank's Area (Boundary Wall)	-		
09	Gas Conditioning Skid	77	84	-
10	Turbine Hall gate b/w HRSG 1&2	91.5		
*11	Turbine Generator coupling	112	127	96.5
*12	Generator Exciter	92	92.7	94.6
*13	Turbine Compartment Compressor	106	111	-
*14	Combustion Chamber	109	110	
15	Basement	96.2		
16	Condensate Pump	95.8		
17	Turbine Hall	92		
18	Turbine Front ST-16	91.5		
19	Center Control Room	67.2		
20	ECR	48		
21	Chemical Pump House	82.5		
22	Fire Fighting Pumps Room	57.5		
23	Main Pump House	82.2		
24	Plant Manager /Admin Office	50		
25	Security Post Gate # 4	62.5		
26	Cooling Tower Area	50.7		
27	Right side(100m) of Turbine Hall (Near Training Center)	68.6		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	66.4		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	64.8		

Note: -* Enclosed Area

Please use Noise Protective Devices in High Noise areas.


 Environmental Supervisor
 747 MW CCPP, CPGCL

CHEMICAL ANALYSIS OF EFFLUENT (OUT FALL STREAM)
747 MW,CCPP, GUDDU

Date	Sample	Temp:	pH	TDS	TSS	Iron	Chloride	Chlorine	COD	Sulphate
-	-	⁰ C	-	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
January-2020	Out fall	20	8.26	292	240	0.086	31.95	0.070	7.08	40

Note:-

- ◇ TSS of Waste Water is directly related to the Turbidity of River Water.
- ◇ Waste water of Power Station includes:-
 - Once through mode (Open Cycle)
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent



Environmental Supervisor
747 MW CCPP, CPGCL

298

MONTHLY ENVIRONMENTAL ASSESSMENT CHECKS LIST

PERFORMA

747 MW, CCPP, CPGCL, GENCO-II, GUDDU, MARCH -2020

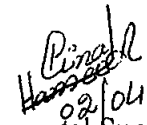
299

Sr. No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material		Quantity	
				HRSG I	HRSG II
01	Stack Emission	i. O ₂	%	13.21	13.13
		ii. CO	ppm	0	3
		iii. CO ₂	%	4.41	4.46
		iv. Nox	ppm	15	16
		v. Sox	ppm	0	0
		vi. Temp	°C	116.7	114.2
02	Water Usage	WATER TREATMENT PLANTS			
03	Liquid Effluent	i. Demi Plant's (Regeneration process) Neutralizing pit		1150 m ³	
		ii. Clarifier Drain		Nil	
		GTs & HRSGs			
		i. Sampling Rack Drain		Approx.: 850 m ³	
		ii. CCCW System (Close Loop.) Drain		Nil	
		iii. Boiler Blow Down (Main Plant Drain Pit)		Nil	
		iv. Condenser Blow Down (Close Cycle)		Nil	
04	Solid Waste (Pertain to Civil Dept:)	i. Sludge Material (WWTP & Clarification Treatment Facilities)		-	
		ii. Operation Trash, Garbage & Cotton Rags		-	
05	Employees Occupational Health	• Satisfactory			
06	Disposal Methods	• Waste Water Effluent Discharged after Neutralization / Treatment.			
07	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)			
08	MISCELLANEOUS FACATORS.				
	i. Spillage of Acid at Demi Plant			Nil	
	ii. Spillage of Caustic at Demi Plant			Nil	
	iii. Spillage of Acid/ Hypo at Cooling Tower			Nil	
	iv. Spillage of Oil			Nil	

Note:-

Waste water of Power Station includes:-

- 99.9% River Water used for Turbine Condenser (Primary Cooling)
- 0.1% Water Treatment Plant and Boiler Blow down Effluent.


 02/04/2020
 Environmental Supervisor
 747 MW CCPP, CPGCL

SOUND LEVEL (dB) OF AT 747MW, CCPP (March, 2020)

300

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	65		
02	PLC Room (Chemical Section)	58		
03	Work Shop	60.5		
04	Hydrogen Plant	61.2		
05	Gas Mixing Station Left side(100m) of Turbine Hall	73		
06	Entrance Gate # 5	69		
07	Hot Water Boiler	70		
08	HSD Tank's Area (Boundary Wall)	67		
09	Gas Conditioning Skid	78.2	78.6	
10	Turbine Hall gate b/w HRSG 1&2	88.6		
*11	Turbine Generator coupling	106	91.0	104
*12	Generator Exciter	109	89.2	107
*13	Turbine Compartment Compressor	111	90	-
*14	Combustion Chamber	115	89	-
15	Basement	86.6		
16	Condensate Pump	92		
17	Turbine Hall	93		
18	Turbine Front ST-16	92		
19	Center Control Room	49		
20	ECR	51		
21	Chemical Pump House	83.6		
22	Fire Fighting Pumps Room	56		
23	Main Pump House	94.2		
24	Plant Manager /Admin Office	55		
25	Security Post Gate # 4	62		
26	Cooling Tower Area	58.3		
27	Right side(100m) of Turbine Hall (Near Training Center)	66		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	68		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	69		

Note: -* Enclosed Area

Please use Noise Protective Devices in High Noise areas.

Pinal Hassani
02/04/2020


Environmental Supervisor
747 MW CCPP, CPGCL

CHEMICAL ANALYSIS OF EFFLUENT (OUT FALL STREAM)
747 MW,CCPP, GUDDU

Date	Sample	Temp:	pH	TDS	TSS	Iron	Chloride	Chlorine	COD	Sulphate	Ammonia
-	-	^o C	-	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
March - 2020	Out fall	24	7.98	183	140	0.084	17.04	0.078	7.52	57.0	0.343

Note:-

- ◇ TSS of Waste Water is directly related to the Turbidity of River Water.
- ◇ Waste water of Power Station includes:-
 - Once through mode (Open Cycle)
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent


 02/04/2020
 Environmental Supervisor
 747 MW CCPP, CPGCL

(591)

MONTHLY ENVIRONMENTAL ASSESSMENT CHECKS LIST
PERFORMA"

747 MW, CCPP, CPGCL, GENCO-II, GUDDU, APRIL -2020

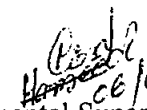
302

Sr. No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material		Quantity	
				HRSG I	HRSG II
01	Stack Emission	i. O ₂	%	13.70	13.15
		ii. CO	ppm	1.0	0
		iii. CO ₂	%	4.49	4.45
		iv. Nox	ppm	18.0	19
		v. Sox	ppm	0	0
		vi. Temp	°C	119.8	109
02	Water Usage	WATER TREATMENT PLANTS			
03	Liquid Effluent	i. Demi Plant's (Regeneration process) Neutralizing pit		2150 m ³	
		ii. Clarifier Drain		Nil	
		GTs & HRSGs			
		i. Sampling Rack Drain		Approx.: 1400 m ³	
		ii. CCCW System (Close Loop.) Drain		Nil	
		iii. Boiler Blow Down (Main Plant Drain Pit)		Nil	
		iv. Condenser Blow Down (Close Cycle)		Nil	
04	Solid Waste (Pertain to Civil Dept:)	i. Sludge Material (WWTP & Clarification Treatment Facilities)		-	
		ii. Operation Trash, Garbage & Cotton Rags		-	
05	Employees Occupational Health	• Satisfactory			
06	Disposal Methods	• Waste Water Effluent Discharged after Neutralization / Treatment.			
07	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)			
08	MISCELLANEOUS FACATORS.				
	i. Spillage of Acid at Demi Plant		Nil		
	ii. Spillage of Caustic at Demi Plant		Nil		
	iii. Spillage of Acid/ Hypo at Cooling Tower		Nil		
	iv. Spillage of Oil		Nil		

Note:-

Waste water of Power Station includes:-

- 99.9% River Water used for Turbine Condenser (Primary Cooling)
- 0.1% Water Treatment Plant and Boiler Blow down Effluent.


 Environmental Supervisor
 747 MW CCPP, CPGCL
 06/05/2020

SOUND LEVEL (dB) OF AT 747MW, CCPP (April-2020)

303

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	73		
02	PLC Room (Chemical Section)	63.5		
03	Work Shop	63		
04	Hydrogen Plant	61		
05	Gas Mixing Station Left side(100m) of Turbine Hall	66		
06	Entrance Gate # 5	67		
07	Hot Water Boiler	65		
08	HSD Tank's Area (Boundary Wall)	66		
09	Gas Conditioning Skid	75	80	
10	Turbine Hall gate b/w HRSG 1&2	86		
*11	Turbine Generator coupling	111	114	95.5
*12	Generator Exciter	90	92	92
*13	Turbine Compartment Compressor	105	104	
*14	Combustion Chamber	107	107	
15	Basement	90		
16	Condensate Pump	92		
17	Turbine Hall	89.4		
18	Turbine Front ST-16	87.6		
19	Center Control Room	55		
20	ECR	56		
21	Chemical Pump House	62		
22	Fire Fighting Pumps Room	60		
23	Main Pump House	64		
24	Plant Manager /Admin Office	48		
25	Security Post Gate # 4	56		
26	Cooling Tower Area	58		
27	Right side(100m) of Turbine Hall (Near Training Center)	66		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	70		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	69		

Note: -* Enclosed Area

Please use Noise Protective Devices in High Noise areas.

[Signature]
06/05/2020
Environmental Supervisor
747 MW CCPP, CPGCL

CHEMICAL ANALYSIS OF EFFLUENT (OUT FALL STREAM)

747 MW,CCPP, GUDDU

Date	Sample	Temp:	pH	TDS	TSS	Iron	Chloride	Chlorine	COD	Sulphate	Ammonia
-		^o C	-	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
April - 2020	Out fall	26	8.17	3436	60	0.19	1175	35	8.8	48	0.320

Note:-

- ◇ TSS of Waste Water is directly related to the Turbidity of River Water.
- ◇ Waste water of Power Station includes:-
 - Once through mode (Open Cycle)
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent

Pined
Hammer
06/05/2020
Environmental Supervisor
747 MW CCPP, CPGCL

(304)

MONTHLY ENVIRONMENTAL ASSESSMENT CHECKS LIST™

PERFORMA™

747 MW, CCPP, CPGCL, GENCO-II, GUDDU, MAY -2020

305

S. No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material			Quantity		
					HRSG I	HRSG II	
01	Stack Emission	i. O ₂	%		13.70	13.1	
		ii. CO	ppm		1.0	0	
		iii. CO ₂	%		4.49	4.45	
		iv. Nox	ppm		18.0	19	
		v. Sox	ppm		0	0	
		vi. Temp	°C		119.8	109	
02	Water Usage	WATER TREATMENT PLANTS					
03	Liquid Effluent	i. Demi Plant's (Regeneration process)	Neutralizing pit		1500 m ³		
		ii. Clarifier Drain			Nil		
		GTs & HRSGs					
		i. Sampling Rack Drain			Approx.: 1400 m ³		
		ii. CCCW System (Close Loop.) Drain			Nil		
		iii. Boiler Blow Down (Main Plant Drain Pit)			Nil		
		iv. Condenser Blow Down (Close Cycle)			Nil		
04	Solid Waste (Pertain to Civil Dept:)	i. Sludge Material (WWTP & Clarification Treatment Facilities)			-		
		ii. Operation Trash, Garbage & Cotton Rags			-		
05	Employees Occupational Health	• Satisfactory					
06	Disposal Methods	• Waste Water Effluent Discharged after Neutralization / Treatment.					
07	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)					
08	MISCELLANEOUS FACATORS.						
		i. Spillage of Acid at Demi Plant			Nil		
		ii. Spillage of Caustic at Demi Plant			Nil		
		iii. Spillage of Acid/ Hypo at Cooling Tower			Nil		
		iv. Spillage of Oil			Nil		

Note:-

Waste water of Power Station includes:-

- 99.9% River Water used for Turbine Condenser (Primary Cooling)
- 0.1% Water Treatment Plant and Boiler Blow down Effluent.


 Environmental Supervisor
 747 MW CCPP, CPGCL

CHECKS LIST


SOUND LEVEL (dB) OF AT 747MW, CCPP (MAY-2020)

36

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	73		
02	PLC Room (Chemical Section)	63.5		
03	Work Shop	63		
04	Hydrogen Plant	61		
05	Gas Mixing Station Left side(100m) of Turbine Hall	66		
06	Entrance Gate # 5	67		
07	Hot Water Boiler	65		
08	HSD Tank's Area (Boundary Wall)	66		
09	Gas Conditioning Skid	75	80	
10	Turbine Hall gate b/w HRSG 1&2	86		
*11	Turbine Generator coupling	111	114	95.5
*12	Generator Exciter	90	92	92
*13	Turbine Compartment Compressor	105	104	
*14	Combustion Chamber	107	107	
15	Basement	90		
16	Condensate Pump	92		
17	Turbine Hall	89.4		
18	Turbine Front ST-16	87.6		
19	Center Control Room	55		
20	ECR	56		
21	Chemical Pump House	62		
22	Fire Fighting Pumps Room	60		
23	Main Pump House	64		
24	Plant Manager /Admin Office	48		
25	Security Post Gate # 4	56		
26	Cooling Tower Area	58		
27	Right side(100m) of Turbine Hall (Near Training Center)	66		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	70		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	69		

Note: -* Enclosed Area

Please use Noise Protective Devices in High Noise areas.

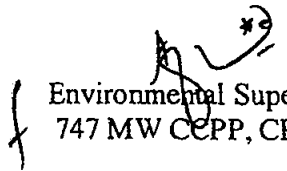

 Environmental Supervisor
 747 MW CCPP, CPGCL

CHEMICAL ANALYSIS OF EFFLUENT (OUT FALL STREAM)
747 MW,CCPP, GUDDU

Date	Sample	Temp:	pH	TDS	TSS	Iron	Chloride	Chlorine	COD	Sulphate	Ammonia
-	-	^o C	-	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
May - 2020	Out fall	29	8.22	3140	68	0.18	1044	32	8.92	56	0.228

Note:-

- ◇ TSS of Waste Water is directly related to the Turbidity of River Water.
- ◇ Waste water of Power Station includes:-
 - Once through mode (Open Cycle)
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent


Environmental Supervisor
747 MW CCPP, CPGCL

MONTHLY ENVIRONMENTAL ASSESSMENT CHECKS LIST"

PERFORMA"

747 MW, CCPP, CPGCL, GENCO-II, GUDDU, JUNE -2020


308

Sr. No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material		Quantity	
				HRSG I	HRSG II
01	Stack Emission	i. O ₂	%	13.42	13.20
		ii. CO	ppm	1.0	0
		iii. CO ₂	%	4.38	4.53
		iv. Nox	ppm	17.0	18
		v. Sox	Ppm	0)
		vi. Temp	•C	116.8	1.0
02	Water Usage	WATER TREATMENT PLANTS			
03	Liquid Effluent	i. Demi Plant's (Regeneration process) Neutralizing pit			
		ii. Clarifier Drain			
		GTs & HRSGs			
		i. Sampling Rack Drain			
		ii. CCCW System (Close Loop.) Drain			
		iii. Boiler Blow Down (Main Plant Drain Pit)			
04	Solid Waste (Pertain to Civil Dept:)	i. Sludge Material (WWTP & Clarification Treatment Facilities)			
		ii. Operation Trash, Garbage & Cotton Rags			
05	Employees Occupational Health	• Satisfactory			
06	Disposal Methods	• Waste Water Effluent Discharged after Neutralization / Treatment.			
07	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)			
08	MISCELLANEOUS FACATORS.				
	i. Spillage of Acid at Demi Plant			Nil	
	ii. Spillage of Caustic at Demi Plant			Nil	
	iii. Spillage of Acid/ Hypo at Cooling Tower			Nil	
	iv. Spillage of Oil			Nil	

Note:-

Waste water of Power Station includes:-

- 99.9% River Water used for Turbine Condenser (Primary Cooling)
- 0.1% Water Treatment Plant and Boiler Blow down Effluent.


 Environmental Supervisor
 747 MW CCPP, CPGCL


SOUND LEVEL (dB) OF AT 747MW, CCPP (JUNE-2020)

309

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	67		
02	PLC Room (Chemical Section)	60.5		
03	Work Shop	62		
04	Hydrogen Plant	59		
05	Gas Mixing Station Left side(100m) of Turbine Hall	68		
06	Entrance Gate # 5	69		
07	Hot Water Boiler	68		
08	HSD Tank's Area (Boundary Wall)	65		
09	Gas Conditioning Skid	76	79	
10	Turbine Hall gate b/w HRSG 1&2	84		
*11	Turbine Generator coupling	110	115	97.5
*12	Generator Exciter	91	93	93
*13	Turbine Compartment Compressor	104	106	
*14	Combustion Chamber	106	108	
15	Basement	91		
16	Condensate Pump	93		
17	Turbine Hall	87.4		
18	Turbine Front ST-16	85.6		
19	Center Control Room	54		
20	ECR	56		
21	Chemical Pump House	62		
22	Fire Fighting Pumps Room	60		
23	Main Pump House	60		
24	Plant Manager /Admin Office	47		
25	Security Post Gate # 4	54		
26	Cooling Tower Area	56		
27	Right side(100m) of Turbine Hall (Near Training Center)	65		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	69		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	70		

Note: -* Enclosed Area

Please use Noise Protective Devices in High Noise areas.


 Environmental Supervisor
 747 MW CCPP, CPGCL

CHEMICAL ANALYSIS OF EFFLUENT (OUT FALL STREAM)
747 MW,CCPP, GUDDU

Date	Sample	Temp:	pH	TDS	TSS	Iron	Chloride	Chlorine	COD	Sulphate	Ammonia
-		^o C	-	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
June -2020	Out fall	38	8.3	210	68	0.086	23.08	0.07	6.22	52	0.208

Note:-

- ◇ TSS of Waste Water is directly related to the Turbidity of River Water.
- ◇ Waste water of Power Station includes:-
 - Once through mode (Open Cycle)
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent

Environmental Supervisor
747 MW CCPP, CPGCL

**MONTHLY ENVIRONMENTAL ASSESSMENT CHECKS LIST"
PERFORMA"**

747 MW, CCPP, CPGCL, GENCO-II, GUDDU, JULY -2020

311

No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material		Quantity	
				HRSG I	HRSG II
01	Stack Emission	i. O ₂	%	13.55	13.40
		ii. CO	ppm	1.0	0
		iii. CO ₂	%	4.32	4.43
		iv. Nox	ppm	16.0	19
		v. Sox	Ppm	0	0
		vi. Temp	°C	115.8	109
02	Water Usage	WATER TREATMENT PLANTS			
03	Liquid Effluent	i. Demi Plant's (Regeneration process) Neutralizing pit		1900 m ³	
		ii. Clarifier Drain		Nil	
		GTs & HRSGs			
		i. Sampling Rack Drain		Approx.:1300 m ³	
		ii. CCCW System (Close Loop.) Drain		Nil	
		iii. Boiler Blow Down (Main Plant Drain Pit)		Nil	
	Solid Waste (Pertain to Civil Dept.)	i. Sludge Material (WWTP & Clarification Treatment Facilities)		-	
		ii. Operation Trash, Garbage & Cotton Rags		-	
05	Employees Occupational Health	• Satisfactory			
06	Disposal Methods	• Waste Water Effluent Discharged after Neutralization / Treatment.			
07	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)			
08	MISCELLANEOUS FACATORS.				
	i. Spillage of Acid at Demi Plant			Nil	
	ii. Spillage of Caustic at Demi Plant			Nil	
	iii. Spillage of Acid/ Hypo at Cooling Tower			Nil	
	iv. Spillage of Oil			Nil	

Note:-

Waste water of Power Station includes:-

- 99.9% River Water used for Turbine Condenser (Primary Cooling)
- 0.1% Water Treatment Plant and Boiler Blow down Effluent.

Environmental Supervisor
747 MW COPP, CPGCL

SOUND LEVEL (dB) OF AT 747MW, CCPP (JULY-2020)

312

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	65		
02	PLC Room (Chemical Section)	61.5		
03	Work Shop	63		
04	Hydrogen Plant	60		
05	Gas Mixing Station Left side(100m) of Turbine Hall	65		
06	Entrance Gate # 5	68		
07	Hot Water Boiler	69		
08	HSD Tank's Area (Boundary Wall)	64		
09	Gas Conditioning Skid	75	78	
10	Turbine Hall gate b/w HRSG 1&2	83		
*11	Turbine Generator coupling	109	114	98.5
*12	Generator Exciter	91	93	95
*13	Turbine Compartment Compressor	103	105	
*14	Combustion Chamber	104	107	
15	Basement	92		
16	Condensate Pump	90		
17	Turbine Hall	85.4		
18	Turbine Front ST-16	84.6		
19	Center Control Room	55		
20	ECR	54		
21	Chemical Pump House	60		
22	Fire Fighting Pumps Room	59		
23	Main Pump House	58		
24	Plant Manager /Admin Office	46		
25	Security Post Gate # 4	53		
26	Cooling Tower Area	54		
27	Right side(100m) of Turbine Hall (Near Training Center)	66		
28	Right side (100m) of Turbine Hall (Near Sarab Yard)	67		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	69		

Note: -* Enclosed Area

Please use Noise Protective Devices in High Noise areas.

Environmental Supervisor

CHEMICAL ANALYSIS OF EFFLUENT (OUT FALL STREAM)

747 MW,CCPP, GUDDU

Date	Sample	Temp:	pH	TDS	TSS	Iron	Chloride	Chlorine	COD	Sulphate	Ammonia
-	-	°C	-	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
July -2020	Out fall	39	8.23	208	116	0.092	21.70	0.09	6.42	56	0.212

Note:-

- ◇ TSS of Waste Water is directly related to the Turbidity of River Water.
- ◇ Waste water of Power Station includes:-
 - Once through mode (Open Cycle)
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent

Environmental Supervisor
747 MW,CCPP, CPGCL

313

MONTHLY ENVIRONMENTAL ASSESSMENT CHECKS LIST™

PERFORMA™

747 MW, CCPP, CPGCL, GENCO-II, GUDDU, AUGUST -2020

314

Sr. No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material		Quantity	
				HRSG I	HRSG II
01	Stack Emission	i. O ₂	%	13.35	13.46
		ii. CO	ppm	0	0
		iii. CO ₂	%	4.42	4.53
		iv. NOx	ppm	15.0	18
		v. Sox	Ppm	0	0
		vi. Temp	°C	108.8	110
02	Water Usage	WATER TREATMENT PLANTS. I			
03	Liquid Effluent	i. Demi Plant's (Regeneration process) Neutralizing pit		1950 m ³	
		ii. Clarifier Drain		Nil	
		GTs & HRSGs			
		i. Sampling Rack Drain		Approx. 138 m ³	
		ii. CCCW System (Close Loop.) Drain		Nil	
		iii. Boiler Blow Down (Main Plant Drain Pit)		Nil	
04	Solid Waste (Pertain to Civil Dept:)	i. Sludge Material (WWTP & Clarification Treatment Facilities)		-	
		ii. Operation Trash, Garbage & Cotton Rags		-	
05	Employees Occupational Health	• Satisfactory			
06	Disposal Methods	• Waste Water Effluent Discharged after Neutralization / Treatment.			
07	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)			
08	MISCELLANEOUS FACATORS.				
	i. Spillage of Acid at Demi Plant				Nil
	ii. Spillage of Caustic at Demi Plant				Nil
	iii. Spillage of Acid/ Hypo at Cooling Tower				Nil
	iv. Spillage of Oil				Nil

Note:-

Waste water of Power Station includes:-

- 99.9% River Water used for Turbine Condenser (Primary Cooling)
- 0.1% Water Treatment Plant and Boiler Blow down Effluent.

Environmental Supervisor
747 MW CCPP, CPGCL

SOUND LEVEL (dB) OF AT 747MW, CCPP (August-2020)

315

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	64		
02	PLC Room (Chemical Section)	64.5		
03	Work Shop	66		
04	Hydrogen Plant	62		
05	Gas Mixing Station Left side(100m) of Turbine Hall	65		
06	Entrance Gate # 5	67		
07	Hot Water Boiler	68		
08	HSD Tank's Area (Boundary Wall)	65		
09	Gas Conditioning Skid	74	77	
10	Turbine Hall gate b/w HRSO 1&2	85		
*11	Turbine Generator coupling	109	114	99.5
*12	Generator Exciter	93	94	96
*13	Turbine Compartment Compressor	104	106	
*14	Combustion Chamber	105	106	
15	Basement	93		
16	Condensate Pump	91		
17	Turbine Hall	86.4		
18	Turbine Front ST-16	85.6		
19	Center Control Room	56		
20	ECR	55		
21	Chemical Pump House	59		
22	Fire Fighting Pumps Room	60		
23	Main Pump House	58		
24	Plant Manager /Admin Office	49		
25	Security Post Gate # 4	51		
26	Cooling Tower Area	53		
27	Right side(100m) of Turbine Hall (Near Training Center)	67		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	68		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	70		

Note: -* Inclosed Area

Please use Noise Protective Devices in High Noise areas.


Environmental Supervisor

**CHEMICAL ANALYSIS OF EFFLUENT (OUT FALL STREAM)
747 MW,CCPP, GUDDU**

Date	Sample	Temp:	pH	TDS	TSS	Iron	Chloride	Chlorine	COD	Sulphate	Ammonia
-	-	^o C	-	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
August -2020	Out fall	38	8.30	212	132	0.096	24.08	0.07	6.07	52	0.206

Note:-

- ◇ TSS of Waste Water is directly related to the Turbidity of River Water.
- ◇ Waste water of Power Station includes:-
 - Once through mode (Open Cycle)
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent


 Environmental Supervisor
 747 MW CCPP, CPGCL

212

**MONTHLY ENVIRONMENTAL ASSESSMENT CHECKS LIST"
PERFORMA"**

747 MW, CCPP, CPGCL, GENCO-II, GUDDU, SEPTEMBER -2020

312

Sr. No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material	Quantity		
			HRSG I	HRSG II	
01	Stack Emission	i. O ₂	%	13.57	13.61
		ii. CO	ppm	0	1
		iii. CO ₂	%	4.21	4.19
		iv. Nox	ppm	18	15
		v. Sox	Ppm	0	0
		vi. Temp	°C	109	102
02	Water Usage	WATER TREATMENT PLANTS			
03	Liquid Effluent	i. Demi Plant's (Regeneration process) Neutralizing pit			1800 m ³
		ii. Clarifier Drain			Nil
		GTs & HRSGs			
		i. Sampling Rack Drain			Approx.:1450 m ³
		ii. CCCW System (Close Loop.) Drain			Nil
		iii. Boiler Blow Down (Main Plant Drain Pit)			Nil
04	Solid Waste (Pertain to Civil Dept:)	i. Sludge Material (WWTP & Clarification Treatment Facilities)			-
		ii. Operation Trash, Garbage & Cotton Rags			-
05	Employees Occupational Health	• Satisfactory			
06	Disposal Methods	• Waste Water Effluent Discharged after Neutralization / Treatment.			
07	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)			
08	MISCELLANEOUS FACATORS.				
	i. Spillage of Acid at Demi Plant			Nil	
	ii. Spillage of Caustic at Demi Plant			Nil	
	iii. Spillage of Acid/ Hypo at Cooling Tower			Nil	
	iv. Spillage of Oil			Nil	

Note:-

Waste water of Power Station includes:-

- 99.9% River Water used for Turbine Condenser (Primary Cooling)
- 0.1% Water Treatment Plant and Boiler Blow down Effluent.


 Environmental Supervisor
 747 MW CCPP, CPGCL


SOUND LEVEL (dB) OF AT 747MW, CAPP (September-2020)

318

Sr. No.	Location/Area	747 MW CAPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	70		
02	PLC Room (Chemical Section)	62.0		
03	Work Shop	60		
04	Hydrogen Plant	58		
05	Gas Mixing Station Left side(100m) of Turbine Hall	65.8		
06	Entrance Gate # 5	64.		
07	Hot Water Boiler	66		
08	HSD Tank's Area (Boundary Wall)	66		
09	Gas Conditioning Skid	76.5	78	-
10	Turbine Hall gate b/w HRSG 1&2	90.4		
*11	Turbine Generator coupling	91	93	90
*12	Generator Exciter	90	92	89
*13	Turbine Compartment Compressor	115	113	-
*14	Combustion Chamber	109	111	-
15	Basement	91		
16	Condensate Pump	90		
17	Turbine Hall	90		
18	Turbine Front ST-16	78		
19	Center Control Room	49		
20	ECR	51		
21	Chemical Pump House	83.7		
22	Fire Fighting Pumps Room	55.7		
23	Main Pump House	87		
24	Plant Manager /Admin Office	48		
25	Security Post Gate # 4	58		
26	Cooling Tower Area	55		
27	Right side(100m) of Turbine Hall (Near Training Center)	66.9		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	64.5		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	64.3		

Note: -* Enclosed Area

Please use Noise Protective Devices in High Noise areas.



 Environmental Supervisor
 747 MW CAPP, CPGCL

CHEMICAL ANALYSIS OF EFFLUENT (OUT FALL STREAM)
747 MW,CCPP, GUDDU

Date	Sample	Temp:	pH	TDS	TSS	Iron	Chloride	Chlorine	COD	Sulphate	Ammonia
-	-	^o C	-	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
September 2020	Out fall	37	8.25	222	138	0.092	22.05	0.09	5.87	54	0.208

Note:-

- ◇ TSS of Waste Water is directly related to the Turbidity of River Water.
- ◇ Waste water of Power Station includes:-
 - Once through mode (Open Cycle)
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent


Environmental Supervisor
747 MW CCPP, CPGCL

**MONTHLY ENVIRONMENTAL ASSESSMENT CHECKS LIST"
PERFORMA"**

747 MW, CCGP, CPGCL, GENCO-II, GUDDU, OCTOBER -2020

320

Sr. No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material		Quantity	
				HRSG I	HRSG II
01	Stack Emission	i. O ₂	%	13.37	13.50
		ii. CO	ppm	0	0
		iii. CO ₂	%	4.32	4.25
		iv. Nox	ppm	21	19
		v. Sox	Ppm	2	2
		vi. Temp	°C	111.3	110.2
02	Water Usage	WATER TREATMENT PLANTS			
03	Liquid Effluent	i. Demi Plant's (Regeneration process) Neutralizing pit		1850 m ³	
		ii. Clarifier Drain		Nil	
		GTs & HRSGs			
		i. Sampling Rack Drain		Approx.: 1400 m ³	
		ii. CCCW System (Close Loop.) Drain		Nil	
		iii. Boiler Blow Down (Main Plant Drain Pit)		Nil	
iv. Condenser Blow Down (Close Cycle)		Nil			
04	Solid Waste (Pertain to Civil Dept:)	i. Sludge Material (WWTP & Clarification Treatment Facilities)		-	
		ii. Operation Trash, Garbage & Cotton Rags		-	
05	Employees Occupational Health	• Satisfactory			
06	Disposal Methods	• Waste Water Effluent Discharged after Neutralization / Treatment.			
07	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)			
08	MISCELLANEOUS FACATORS.				
	i. Spillage of Acid at Demi Plant			Nil	
	ii. Spillage of Caustic at Demi Plant			Nil	
	iii. Spillage of Acid/ Hypo at Cooling Tower			Nil	
	iv. Spillage of Oil			Nil	

Note:-

Waste water of Power Station includes:-

- 99.9% River Water used for Turbine Condenser (Primary Cooling)
- 0.1% Water Treatment Plant and Boiler Blow down Effluent.


 Environmental Supervisor
 747 MW CCGP, CPGCL


SOUND LEVEL (dB) OF AT 747MW, CCPP (October -2020)

321

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	67		
02	PLC Room (Chemical Section)	62		
03	Work Shop	59		
04	Hydrogen Plant	60		
05	Gas Mixing Station Left side(100m) of Turbine Hall	65		
06	Entrance Gate # 5	68		
07	Hot Water Boiler	72		
08	HSD Tank's Area (Boundary Wall)	66		
09	Gas Conditioning Skid	86	83	-
10	Turbine Hall gate b/w HRSG 1&2	88		
*11	Turbine Generator coupling	122	116	97
*12	Generator Exciter	93	92	96
*13	Turbine Compartment Compressor	105	105	-
*14	Combustion Chamber	109	110	-
15	Basement	95		
16	Condensate Pump	92		
17	Turbine Hall	87.8		
18	Turbine Front ST-16	87		
19	Center Control Room	58		
20	ECR	48		
21	Chemical Pump House	58		
22	Fire Fighting Pumps Room	51		
23	Main Pump House	80		
24	Plant Manager /Admin Office	51		
25	Security Post Gate # 4	58		
26	Cooling Tower Area	55		
27	Right side(100m) of Turbine Hall (Near Training Center)	67		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	64		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	63		

Note: -* Enclosed Area

Please use Noise Protective Devices in High Noise areas.

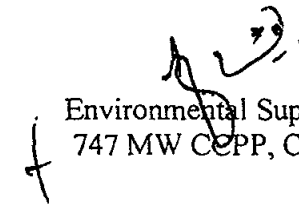

 Environmental Supervisor
 747 MW CCPP, CPGCL

CHEMICAL ANALYSIS OF EFFLUENT (OUT FALL STREAM)
747 MW,CCPP, GUDDU

Date	Sample	Temp:	pH	TDS	TSS	Iron	Chloride	Chlorine	COD	Sulphate	Ammonia
-	-	⁰ C	-	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
October 2020	Out fall	36	8.10	212	125	0.092	21.07	0.08	6.10	54	0.30

Note:-

- ✧ TSS of Waste Water is directly related to the Turbidity of River Water.
- ✧ Waste water of Power Station includes:-
 - Once through mode (Open Cycle)
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent


Environmental Supervisor
747 MW CCPP, CPGCL

**MONTHLY ENVIRONMENTAL ASSESSMENT CHECKS LIST"
PERFORMA"**

747 MW, CCPP, CPGCL, GENCO-II, GUDDU, DECEMBER-2020

323

Sr. No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material		Quantity	
				HRSG I	HRSG II
01	Stack Emission	i. O ₂	%	13.20	13.22
		ii. CO	ppm	0	0
		iii. CO ₂	%	4.42	4.41
		iv. Nox	ppm	20	15
		v. Sox	Ppm	2	3
		vi. Temp	°C	103.8	108
02	Water Usage	WATER TREATMENT PLANTS			
03	Liquid Effluent	i. Demi Plant's (Regeneration process) Neutralizing pit		1750 m ³	
		ii. Clarifier Drain		Nil	
		GTs & HRSGs			
		i. Sampling Rack Drain		Approx.:1400 m ³	
		ii. CCCW System (Close Loop.) Drain		Nil	
		iii. Boiler Blow Down (Main Plant Drain Pit)		Nil	
		iv. Condenser Blow Down (Close Cycle)		Nil	
04	Solid Waste (Pertain to Civil Dept:)	i. Sludge Material (WWTP & Clarification Treatment Facilities)		-	
		ii. Operation Trash, Garbage & Cotton Rags		-	
05	Employees Occupational Health	• Satisfactory			
06	Disposal Methods	• Waste Water Effluent Discharged after Neutralization / Treatment.			
07	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)			
08	MISCELLANEOUS FACATORS.				
	i. Spillage of Acid at Demi Plant				Nil
	ii. Spillage of Caustic at Demi Plant				Nil
	iii. Spillage of Acid/ Hypo at Cooling Tower				Nil
	iv. Spillage of Oil				Nil

Note:-

Waste water of Power Station includes:-

- 99.9% River Water used for Turbine Condenser (Primary Cooling)
- 0.1% Water Treatment Plant and Boiler Blow down Effluent.


 Environmental Supervisor
 747 MW CCPP, CPGCL


SOUND LEVEL (dB) OF AT 747MW, CCPP (DECEMBER -2020)

324

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	70		
02	PLC Room (Chemical Section)	60		
03	Work Shop	60		
04	Hydrogen Plant	57		
05	Gas Mixing Station Left side(100m) of Turbine Hall	62		
06	Entrance Gate # 5	65		
07	Hot Water Boiler	70		
08	HSD Tank's Area (Boundary Wall)	58		
09	Gas Conditioning Skid	84	85	-
10	Turbine Hall gate b/w HRSG 1&2	89		
*11	Turbine Generator coupling	122	116	97
*12	Generator Exciter	93	92	96
*13	Turbine Compartment Compressor	105	105	-
*14	Combustion Chamber	109	110	-
15	Basement	93		
16	Condensate Pump	90		
17	Turbine Hall	80		
18	Turbine Front ST-16	83		
19	Center Control Room	60		
20	ECR	48		
21	Chemical Pump House	52		
22	Fire Fighting Pumps Room	54		
23	Main Pump House	84		
24	Plant Manager /Admin Office	48		
25	Security Post Gate # 4	50		
26	Cooling Tower Area	56		
27	Right side(100m) of Turbine Hall (Near Training Center)	68		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	66		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	65		

Note: -* Enclosed Area

Please use Noise Protective Devices in High Noise areas.



 Environmental Supervisor
 747 MW CCPP, CPGCL

CHEMICAL ANALYSIS OF EFFLUENT (OUT FALL STREAM)
747 MW,CCPP, GUDDU

Date	Sample	Temp:	pH	TDS	TSS	Iron	Chloride	Chlorine	COD	Sulphate	Ammonia
-	-	°C	-	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
DECEMBER 2020	Out fall	31	8.1	188	122	0.090	20.1	0.07	6.78	54	0.26

Note:-

- ✧ TSS of Waste Water is directly related to the Turbidity of River Water.
- ✧ Waste water of Power Station includes:-
 - Once through mode (Open Cycle)
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent


Environmental Supervisor
747 MW CCPP, CPGCL

325

MONTHLY ENVIRONMENTAL ASSESSMENT CHECKS LIST"

PERFORMA"

747 MW, CCPP, CPGCL, GENCO-II, GUDDU, NOVEMBER-2020


326

Sr. No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material		Quantity	
				HRSG I	HRSG II
01	Stack Emission	i. O ₂	%	13.24	13.20
		ii. CO	ppm	0	0
		iii. CO ₂	%	4.40	4.42
		iv. Nox	ppm	21	18
		v. Sox	Ppm	0	00
		vi. Temp	°C	108.8	113.7
02	Water Usage	WATER TREATMENT PLANTS			
03	Liquid Effluent	i. Demi Plant's (Regeneration process) Neutralizing pit		1735 m ³	
		ii. Clarifier Drain		Nil	
		GTs & HRSGs			
		i. Sampling Rack Drain		Approx.:1380 m ³	
		ii. CCCW System (Close Loop.) Drain		Nil	
		iii. Boiler Blow Down (Main Plant Drain Pit)		Nil	
04	Solid Waste (Pertain to Civil Dept:)	i. Sludge Material (WWTP & Clarification Treatment Facilities)		-	
		ii. Operation Trash, Garbage & Cotton Rags		-	
05	Employees Occupational Health	• Satisfactory			
06	Disposal Methods	• Waste Water Effluent Discharged after Neutralization / Treatment.			
07	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)			
08	MISCELLANEOUS FACATORS.				
	i. Spillage of Acid at Demi Plant			Nil	
	ii. Spillage of Caustic at Demi Plant			Nil	
	iii. Spillage of Acid/ Hypo at Cooling Tower			Nil	
	iv. Spillage of Oil			Nil	

Note:-

Waste water of Power Station includes:-

- 99.9% River Water used for Turbine Condenser (Primary Cooling)
- 0.1% Water Treatment Plant and Boiler Blow down Effluent.


 Environmental Supervisor
 747 MW CCPP, CPGCL


SOUND LEVEL (dB) OF AT 747MW, CCPP (NOVEMBER -2020)

327

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	68		
02	PLC Room (Chemical Section)	61		
03	Work Shop	60		
04	Hydrogen Plant	58		
05	Gas Mixing Station Left side(100m) of Turbine Hall	64		
06	Entrance Gate # 5	66		
07	Hot Water Boiler	70		
08	HSD Tank's Area (Boundary Wall)	58		
09	Gas Conditioning Skid	84	85	-
10	Turbine Hall gate b/w HRSG 1&2	89		
*11	Turbine Generator coupling	122	116	97
*12	Generator Exciter	93	92	96
*13	Turbine Compartment Compressor	105	105	-
*14	Combustion Chamber	109	110	-
15	Basement	96		
16	Condensate Pump	94		
17	Turbine Hall	86		
18	Turbine Front ST-16	88		
19	Center Control Room	59		
20	ECR	47		
21	Chemical Pump House	57		
22	Fire Fighting Pumps Room	52		
23	Main Pump House	82		
24	Plant Manager /Admin Office	49		
25	Security Post Gate # 4	51		
26	Cooling Tower Area	54		
27	Right side(100m) of Turbine Hall (Near Training Center)	66		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	67		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	64		

Note: -* Enclosed Area

Please use Noise Protective Devices in High Noise areas.



 Environmental Supervisor
 747 MW CCPP, CPGCL

CHEMICAL ANALYSIS OF EFFLUENT (OUT FALL STREAM)
747 MW,CCPP, GUDDU

Date	Sample	Temp:	pH	TDS	TSS	Iron	Chloride	Chlorine	COD	Sulphate	Ammonia
-	-	°C	-	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
November 2020	Out fall	34	8.1	185	124	0.094	21.22	0.09	7.18	52	0.28

Note:-

- ◇ TSS of Waste Water is directly related to the Turbidity of River Water.
- ◇ Waste water of Power Station includes:-
 - Once through mode (Open Cycle)
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent



Environmental Supervisor
747 MW CCPP, CPGCL

Sr. No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material		Quantity	
				HRSG I	HRSG II
01	Stack Emission	i. O ₂	%	13.27	13.26
		ii. CO	ppm	0	0
		iii. CO ₂	%	4.40	4.43
		iv. Nox	ppm	19	17
		v. Sox	Ppm	0	0
		vi. Temp	°C	105.8	110
02	Water Usage	WATER TREATMENT PLANTS			
03	Liquid Effluent	i. Demi Plant's (Regeneration process) Neutralizing pit		1050 m ³	
		ii. Clarifier Drain		Nil	
		GTs & HRSGs			
		i. Sampling Rack Drain		Approx.:800 m ³	
		ii. CCCW System (Close Loop.) Drain		Nil	
		iii. Boiler Blow Down (Main Plant Drain Pit)		Nil	
04	Solid Waste (Pertain to Civil Dept:)	i. Sludge Material (WWTP & Clarification Treatment Facilities)		-	
		ii. Operation Trash, Garbage & Cotton Rags		-	
05	Employees Occupational Health	• Satisfactory			
06	Disposal Methods	• Waste Water Effluent Discharged after Neutralization / Treatment.			
07	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)			
08	MISCELLANEOUS FACATORS.				
	i. Spillage of Acid at Demi Plant				Nil
	ii. Spillage of Caustic at Demi Plant				Nil
	iii. Spillage of Acid/ Hypo at Cooling Tower				Nil
	iv. Spillage of Oil				Nil

Note:-

Waste water of Power Station includes:-

- 99.9% River Water used for Turbine Condenser (Primary Cooling)
- 0.1% Water Treatment Plant and Boiler Blow down Effluent.


 Environmental Supervisor
 747 MW CCPP, CPGCL

33

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	67		
02	PLC Room (Chemical Section)	60.5		
03	Work Shop	62		
04	Hydrogen Plant	59		
05	Gas Mixing Station Left side(100m) of Turbine Hall	68		
06	Entrance Gate # 5	69		
07	Hot Water Boiler	68		
08	HSD Tank's Area (Boundary Wall)	65		
09	Gas Conditioning Skid	76	79	
10	Turbine Hall gate b/w HRSG 1&2	84		
*11	Turbine Generator coupling	110	115	97.5
*12	Generator Exciter	91	93	93
*13	Turbine Compartment Compressor	104	106	
*14	Combustion Chamber	106	108	
15	Basement	91		
16	Condensate Pump	93		
17	Turbine Hall	87.4		
18	Turbine Front ST-16	85.6		
19	Center Control Room	54		
20	ECR	56		
21	Chemical Pump House	62		
22	Fire Fighting Pumps Room	60		
23	Main Pump House	60		
24	Plant Manager /Admin Office	47		
25	Security Post Gate # 4	54		
26	Cooling Tower Area	56		
27	Right side(100m) of Turbine Hall (Near Training Center)	65		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	69		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	70		

Note: -* Enclosed Area

Please use Noise Protective Devices in High Noise areas.

Environmental Supervisor
747 MW CCPP, CPGCL

CHEMICAL ANALYSIS OF EFFLUENT (OUT FALL STREAM)
747 MW,CCPP, GUDDU

Date	Sample	Temp:	pH	TDS	TSS	Iron	Chloride	Chlorine	COD	Sulphate	Ammonia
-	-	^o C	-	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
JANUARY 2021	Out fall	28	8.1	178	125	0.086	19.6	0.06	6.58	52	0.24

Note:-

- ◇ TSS of Waste Water is directly related to the Turbidity of River Water.
- ◇ Waste water of Power Station includes:-
 - Once through mode (Open Cycle)
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent


 Environmental Supervisor
 747 MW CCPP, CPGCL

MONTHLY ENVIRONMENTAL ASSESSMENT CHECKS LIST

PERFORMA

747 MW, CCGP, CPGCL, GENCO-II, GUDDU, FEBRUARY -2021


332

Sr. No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material		Quantity	
				HRSG I	HRSG II
01	Stack Emission	i. O ₂	%	13.32	13.26
		ii. CO	ppm	0	0
		iii. CO ₂	%	4.35	4.55
		iv. Nox	ppm	21	18
		v. Sox	Ppm	1	0
		vi. Temp	°C	107.0	119
02	Water Usage	WATER TREATMENT PLANTS			
03	Liquid Effluent	i. Demi Plant's (Regeneration process) Neutralizing pit		1050 m ³	
		ii. Clarifier Drain		Nil	
		GTs & HRSGs			
		i. Sampling Rack Drain		Approx.:750 m ³	
		ii. CCCW System (Close Loop.) Drain		Nil	
		iii. Boiler Blow Down (Main Plant Drain Pit)		Nil	
04	Solid Waste (Pertain to Civil Dept:)	i. Sludge Material (WWTP & Clarification Treatment Facilities)		-	
		ii. Operation Trash, Garbage & Cotton Rags		-	
05	Employees Occupational Health	• Satisfactory			
06	Disposal Methods	• Waste Water Effluent Discharged after Neutralization / Treatment.			
07	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)			
08	MISCELLANEOUS FACATORS.				
	i. Spillage of Acid at Demi Plant			Nil	
	ii. Spillage of Caustic at Demi Plant			Nil	
	iii. Spillage of Acid/ Hypo at Cooling Tower			Nil	
	iv. Spillage of Oil			Nil	

Note:-

Waste water of Power Station includes:-

- 99.9% River Water used for Turbine Condenser (Primary Cooling)
- 0.1% Water Treatment Plant and Boiler Blow down Effluent.


 Environmental Supervisor
 747 MW CCGP, CPGCL


SOUND LEVEL (dB) OF AT 747MW, CCPP (February -2021)

333

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	67		
02	PLC Room (Chemical Section)	60.5		
03	Work Shop	62		
04	Hydrogen Plant	59		
05	Gas Mixing Station Left side(100m) of Turbine Hall	68		
06	Entrance Gate # 5	69		
07	Hot Water Boiler	68		
08	HSD Tank's Area (Boundary Wall)	65		
09	Gas Conditioning Skid	76	79	
10	Turbine Hall gate b/w HRSG 1&2	84		
*11	Turbine Generator coupling	110	115	97.5
*12	Generator Exciter	91	93	93
*13	Turbine Compartment Compressor	104	106	
*14	Combustion Chamber	106	108	
15	Basement	91		
16	Condensate Pump	93		
17	Turbine Hall	87.4		
18	Turbine Front ST-16	85.6		
19	Center Control Room	54		
20	ECR	56		
21	Chemical Pump House	62		
22	Fire Fighting Pumps Room	60		
23	Main Pump House	60		
24	Plant Manager /Admin Office	47		
25	Security Post Gate # 4	54		
26	Cooling Tower Area	56		
27	Right side(100m) of Turbine Hall (Near Training Center)	65		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	69		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	70		

Note: -* Enclosed Area

Please use Noise Protective Devices in High Noise areas.

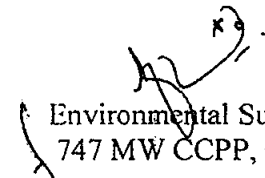

 Environmental Supervisor
 747 MW CCPP, CPGCL

CHEMICAL ANALYSIS OF EFFLUENT (OUT FALL STREAM)
747 MW,CCPP, GUDDU

Date	Sample	Temp:	pH	TDS	TSS	Iron	Chloride	Chlorine	COD	Sulphate	Ammonia
-	-	⁰ C	-	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
FEBRUARY 2021	Out fall	22	8.20	227	123	0.076	14.2	0.06	6.58	52	0.26

Note:-

- ◇ TSS of Waste Water is directly related to the Turbidity of River Water.
- ◇ Waste water of Power Station includes:-
 - Once through mode (Open Cycle)
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent


Environmental Supervisor
747 MW CCPP, CPGCL

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MONTHLY ENVIRONMENTAL ASSESSMENT CHECKS LIST

PERFORMA

747 MW, CCPP, CPGCL, GENCO-II, GUDDU, APRIL-2021

335

Sr. No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material		Quantity	
				HRSG I	HRSG II
01	Stack Emission	i. O ₂	%		13.20
		ii. CO	ppm		0
		iii. CO ₂	%		4.40
		iv. Nox	ppm		18 ¹
		v. Sox	Ppm		0
		vi. Temp	°C		112
02	Water Usage	WATER TREATMENT PLANTS			
03	Liquid Effluent	i. Demi Plant's (Regeneration process) Neutralizing pit		450 m ³	
		ii. Clarifier Drain		Nil	
		GTs & HRSGs			
		i. Sampling Rack Drain		Approx.:300 m ³	
		ii. CCCW System (Close Loop.) Drain		Nil	
		iii. Boiler Blow Down (Main Plant Drain Pit)		Nil	
04	Solid Waste (Pertain to Civil Dept:)	i. Sludge Material (WWTP & Clarification Treatment Facilities)		-	
		ii. Operation Trash, Garbage & Cotton Rags		-	
05	Employees Occupational Health	• Satisfactory			
06	Disposal Methods	• Waste Water Effluent Discharged after Neutralization / Treatment.			
07	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)			
08	MISCELLANEOUS FACATORS.				
	i. Spillage of Acid at Demi Plant		Nil		
	ii. Spillage of Caustic at Demi Plant		Nil		
	iii. Spillage of Acid/ Hypo at Cooling Tower		Nil		
	iv. Spillage of Oil		Nil		

Note:-

Waste water of Power Station includes:-

- 99.9% River Water used for Turbine Condenser (Primary Cooling)
- 0.1% Water Treatment Plant and Boiler Blow down Effluent.


 Environmental Supervisor
 747 MW CCPP, CPGCL

SOUND LEVEL (dB) OF AT 747MW, CCPP (APRIL -2021)

336

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	67		
02	PLC Room (Chemical Section)	60.5		
03	Work Shop	62		
04	Hydrogen Plant	59		
05	Gas Mixing Station Left side(100m) of Turbine Hall	68		
06	Entrance Gate # 5	69		
07	Hot Water Boiler	68		
08	HSD Tank's Area (Boundary Wall)	65		
09	Gas Conditioning Skid	76	79	
10	Turbine Hall gate b/w HRSG 1&2	84		
*11	Turbine Generator coupling	83	115	97.5
*12	Generator Exciter	78	93	93
*13	Turbine Compartment Compressor	83	106	
*14	Combustion Chamber	80	108	
15	Basement	91		
16	Condensate Pump	93		
17	Turbine Hall	87.4		
18	Turbine Front ST-16	85.6		
19	Center Control Room	54		
20	ECR	56		
21	Chemical Pump House	62		
22	Fire Fighting Pumps Room	60		
23	Main Pump House	60		
24	Plant Manager /Admin Office	47		
25	Security Post Gate # 4	54		
26	Cooling Tower Area	56		
27	Right side(100m) of Turbine Hall (Near Training Center)	65		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	69		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	70		

Note: -* Enclosed Area

Please use Noise Protective Devices in High Noise areas.

Environmental Supervisor
747 MW CCPP, CPGCL


CHEMICAL ANALYSIS OF EFFLUENT (OUT FALL STREAM)

747 MW,CCPP, GUDDU

Date	Sample	Temp:	pH	TDS	TSS	Iron	Chloride	Chlorine	COD	Sulphate	Ammonia
-	-	°C	-	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
APRIL- 2021	Out fall	28	8.1	178	125	0.086	19.6	0.06	6.58	52	0.24

Note:-

- ◇ TSS of Waste Water is directly related to the Turbidity of River Water.
- ◇ Waste water of Power Station includes:-
 - Once through mode (Open Cycle)
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent


Environmental Supervisor
747 MW CCPP, CPGCL

337

MONTHLY ENVIRONMENTAL ASSESSMENT CHECKS LIST

PERFORMA

747 MW, CCPP, CPGCL, GENCO-II, GUDDU, MARCH-2021

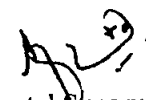
328

Sr. No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material		Quantity	
				HRSG I	HRSG II
01	Stack Emission	i. O ₂	%		13.26
		ii. CO ₁	ppm		0
		iii. CO ₂	%		4.43
		iv. Nox	ppm		17
		v. Sox	Ppm		0
		vi. Temp	°C		110
02	Water Usage	WATER TREATMENT PLANTS			
03	Liquid Effluent	i. Demi Plant's (Regeneration process) Neutralizing pit		550 m ³	
		ii. Clarifier Drain		Nil	
		GTs & HRSGs			
		i. Sampling Rack Drain		Approx.:300 m ³	
		ii. CCCW System (Close Loop.) Drain		Nil	
		iii. Boiler Blow Down (Main Plant Drain Pit)		Nil	
04	Solid Waste (Pertain to Civil Dept:)	i. Sludge Material (WWTP & Clarification Treatment Facilities)		-	
		ii. Operation Trash, Garbage & Cotton Rags		-	
05	Employees Occupational Health	• Satisfactory			
06	Disposal Methods	• Waste Water Effluent Discharged after Neutralization / Treatment.			
07	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)			
08	MISCELLANEOUS FACATORS.				
	i. Spillage of Acid at Demi Plant		Nil		
	ii. Spillage of Caustic at Demi Plant		Nil		
	iii. Spillage of Acid/ Hypo at Cooling Tower		Nil		
	iv. Spillage of Oil		Nil		

Note:-

Waste water of Power Station includes:-

- 99.9% River Water used for Turbine Condenser (Primary Cooling)
- 0.1% Water Treatment Plant and Boiler Blow down Effluent.



 Environmental Supervisor
 747 MW CCPP, CPGCL

SOUND LEVEL (dB) OF AT 747MW, CCPP (March -2021)

339

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	67		
02	PLC Room (Chemical Section)	60.5		
03	Work Shop	62		
04	Hydrogen Plant	59		
05	Gas Mixing Station Left side(100m) of Turbine Hall	68		
06	Entrance Gate # 5	69		
07	Hot Water Boiler	68		
08	HSD Tank's Area (Boundary Wall)	65		
09	Gas Conditioning Skid	76	79	
10	Turbine Hall gate b/w HRSG 1&2	84		
*11	Turbine Generator coupling	89	115	97.5
*12	Generator Exciter	76	93	93
*13	Turbine Compartment Compressor	83	106	
*14	Combustion Chamber	82	108	
15	Basement	91		
16	Condensate Pump	93		
17	Turbine Hall	87.4		
18	Turbine Front ST-16	85.6		
19	Center Control Room	54		
20	ECR	56		
21	Chemical Pump House	62		
22	Fire Fighting Pumps Room	60		
23	Main Pump House	60		
24	Plant Manager /Admin Office	47		
25	Security Post Gate # 4	54		
26	Cooling Tower Area	56		
27	Right side(100m) of Turbine Hall (Near Training Center)	65		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	69		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	70		

Note: -* Enclosed Area
Please use Noise Protective Devices in High Noise areas.


 Environmental Supervisor
 747 MW CCPP, CPGCL


CHEMICAL ANALYSIS OF EFFLUENT (OUT FALL STREAM)

747 MW,CCPP, GUDDU

Date	Sample	Temp:	pH	TDS	TSS	Iron	Chloride	Chlorine	COD	Sulphate	Ammonia
-	-	^o C	-	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
MARCH 2021	Out fall	-	-	-	-	-	-	-	-	-	-

Note:-

- ✧ TSS of Waste Water is directly related to the Turbidity of River Water.
- ✧ Waste water of Power Station includes:-
 - Once through mode (Open Cycle)
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent


Environmental Supervisor
747 MW CCPP, CPGCL

347

MONTHLY ENVIRONMENTAL ASSESSMENT CHECKS LIST"

PERFORMA"

747 MW, CCPP, CPGCL, GENCO-II, GUDDU, MAY-2021

341

Sr. No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material		Quantity	
				HRSG I	HRSG II
01	Stack Emission	i. O ₂	%		14.57
		ii. CO	ppm		19
		iii. CO ₂	%		3.64
		iv. Nox	ppm		7
		v. Sox	Ppm		0
		vi. Temp	°C		107.2
02	Water Usage	WATER TREATMENT PLANTS			
03	Liquid Effluent				
		i. Demi Plant's (Regeneration process) Neutralizing pit			1050 m ³
		ii. Clarifier Drain			Nil
		GTs & HRSGs			
		i. Sampling Rack Drain			Approx.:800 m ³
		ii. CCCW System (Close Loop.) Drain			Nil
04	Solid Waste (Pertain to Civil Dept:)	iii. Boiler Blow Down (Main Plant Drain Pit)			Nil
		iv. Condenser Blow Down (Close Cycle)			Nil
		i. Sludge Material (WWTP & Clarification Treatment Facilities)			-
		ii. Operation Trash, Garbage & Cotton Rags			-
05	Employees Occupational Health	• Satisfactory			
06	Disposal Methods	• Waste Water Effluent Discharged after Neutralization / Treatment.			
07	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)			
08	MISCELLANEOUS FACATORS.				
	i. Spillage of Acid at Demi Plant				Nil
	ii. Spillage of Caustic at Demi Plant				Nil
	iii. Spillage of Acid/ Hypo at Cooling Tower				Nil
	iv. Spillage of Oil				Nil

Note:-

Waste water of Power Station includes:-

- 99.9% River Water used for Turbine Condenser (Primary Cooling)
- 0.1% Water Treatment Plant and Boiler Blow down Effluent.


 Environmental Supervisor
 747 MW CCPP, CPGCL

OUND LEVEL (dB) OF AT 747MW, CCFP (MAY -2020)

342

Sr. No.	Location/Area	747 MW CCFP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	67		
02	PLC Room (Chemical Section)	60.5		
03	Work Shop	62		
04	Hydrogen Plant	59		
05	Gas Mixing Station Left side(100m) of Turbine Hall	68		
06	Entrance Gate # 5	69		
07	Hot Water Boiler	68		
08	HSD Tank's Area (Boundary Wall)	65		
09	Gas Conditioning Skid	76	79	
10	Turbine Hall gate b/w HRSG 1&2	84		
*11	Turbine Generator coupling	110	115	97.5
*12	Generator Exciter	91	93	93
*13	Turbine Compartment Compressor	104	106	
*14	Combustion Chamber	106	108	
15	Basement	91		
16	Condensate Pump	93		
17	Turbine Hall	87.4		
18	Turbine Front ST-16	85.6		
19	Center Control Room	54		
20	ECR	56		
21	Chemical Pump House	62		
22	Fire Fighting Pumps Room	60		
23	Main Pump House	60		
24	Plant Manager /Admin Office	47		
25	Security Post Gate # 4	54		
26	Cooling Tower Area	56		
27	Right side(100m) of Turbine Hall (Near Training Center)	65		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	69		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	70		

Note: -* Enclosed Area

Please use Noise Protective Devices in High Noise areas.


[Signature]
 Environmental Supervisor
 747 MW CCFP, CPGCL

CHEMICAL ANALYSIS OF EFFLUENT (OUT FALL STREAM)
747 MW,CCPP, GUDDU

Date	Sample	Temp:	pH	TDS	TSS	Iron	Chloride	Chlorine	COD	Sulphate	Ammonia
-	-	^o C	-	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
MAY-2021	Out fall										

Note:-

- ◇ Closed cycle was in service.
- ◇ TSS of Waste Water is directly related to the Turbidity of River Water.
- ◇ Waste water of Power Station includes:-
 - Once through mode (Open Cycle)
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent


 Environmental Supervisor
 747 MW CCPP. CPGCL

343

MONTHLY ENVIRONMENTAL ASSESSMENT CHECKS LIST

PERFORMA


747 MW, CCPP, CPGCL, GENCO-II, GUDDU, JUNE-2021

344

Sr. No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material		Quantity	
				HRSG I	HRSG II
01	Stack Emission	i. O ₂	%	--	13.20
		ii. CO	ppm	--	0
		iii. CO ₂	%	--	4.42
		iv. Nox	ppm	--	15
		v. Sox	Ppm	--	0
		vi. Temp	°C	--	109.5
02	Water Usage	WATER TREATMENT PLANTS			
03	Liquid Effluent	i. Demi Plant's (Regeneration process) Neutralizing pit		550 m ³	
		ii. Clarifier Drain		Nil	
		GTs & HRSGs			
		i. Sampling Rack Drain		Approx.:350 m ³	
		ii. CCCW System (Close Loop.) Drain		Nil	
		iii. Boiler Blow Down (Main Plant Drain Pit)		Nil	
04	Solid Waste (Pertain to Civil Dept:)	i. Sludge Material (WWTP & Clarification Treatment Facilities)		-	
		ii. Operation Trash, Garbage & Cotton Rags		-	
05	Employees Occupational Health	• Satisfactory			
06	Disposal Methods	• Waste Water Effluent Discharged after Neutralization / Treatment.			
07	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)			
08	MISCELLANEOUS FACATORS.				
	i. Spillage of Acid at Demi Plant		Nil		
	ii. Spillage of Caustic at Demi Plant		Nil		
	iii. Spillage of Acid/ Hypo at Cooling Tower		Nil		
	iv. Spillage of Oil		Nil		

Note:-

- Cooling Tower was in service (Closed Cycle)
- Waste water of Power Station includes:-
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent.


 Environment Supervisor
 747 MW CCPP, CPGCL

SOUND LEVEL (dB) OF AT 747MW, CCPP (JUNE -2021)

345

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	65		
02	PLC Room (Chemical Section)	59.5		
03	Work Shop	60		
04	Hydrogen Plant	58		
05	Gas Mixing Station Left side(100m) of Turbine Hall	66		
06	Entrance Gate # 5	68		
07	Hot Water Boiler	67		
08	HSD Tank's Area (Boundary Wall)	64		
09	Gas Conditioning Skid	70	76	
10	Turbine Hall gate b/w HRSG 1&2	82		
*11	Turbine Generator coupling	95	114	97.5
*12	Generator Exciter	84	91	93
*13	Turbine Compartment Compressor	95	105	
*14	Combustion Chamber	93	107	
15	Basement	90		
16	Condensate Pump	94		
17	Turbine Hall	88.4		
18	Turbine Front ST-16	86.6		
19	Center Control Room	52		
20	ECR	50		
21	Chemical Pump House	60		
22	Fire Fighting Pumps Room	58		
23	Main Pump House	62		
24	Plant Manager /Admin Office	46		
25	Security Post Gate # 4	53		
26	Cooling Tower Area	57		
27	Right side(100m) of Turbine Hall (Near Training Center)	66		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	68		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	72		

Note: -* Enclosed Area

Please use Noise Protective Devices in High Noise areas.


 Environment Supervisor
 747 MW CCPP, CPGCL


CHEMICAL ANALYSIS OF EFFLUENT (OUT FALL STREAM)

747 MW, CCPP, GUDDU

Date	Sample	Temp:	pH	TDS	TSS	Iron	Chloride	Chlorine	COD	Sulphate	Ammonia
-	-	°C	-	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
JUNE-2021	Out fall	--	--	--	--	--	--	--	--	--	--

Note:-

- ◇ Cooling Tower was in service (Closed Cycle)
- ◇ TSS of Waste Water is directly related to the Turbidity of River Water.
- ◇ Waste water of Power Station includes:-
 - Once through mode (Open Cycle)
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent


Environment Supervisor
747 MW CCPP, CPGCL

MONTHLY ENVIRONMENTAL ASSESSMENT CHECKS LIST

PERFORMA

747 MW, CCPP, CPGCL, GENCO-II, GUDDU, JULY-2021


217

Sr. No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material	Quantity		
			HRSG I	HRSG II	
01	Stack Emission	i. O ₂	%	--	13.06
		ii. CO	ppm	--	0
		iii. CO ₂	%	--	4.50
		iv. Nox	ppm	--	15
		v. Sox	Ppm	--	0
		vi. Temp	°C	--	111.5
02	Water Usage	WATER TREATMENT PLANTS			
03	Liquid Effluent	WATER TREATMENT PLANTS			
		i. Demi Plant's (Regeneration process) Neutralizing pit	450 m ³		
		ii. Clarifier Drain	Nil		
		GTs & HRSGs			
		i. Sampling Rack Drain	Approx.:550 m ³		
		ii. CCCW System (Close Loop.) Drain	Nil		
04	Solid Waste (Pertain to Civil Dept:)	iii. Boiler Blow Down (Main Plant Drain Pit)	Nil		
		iv. Condenser Blow Down (Close Cycle)	Nil		
		i. Sludge Material (WWTP & Clarification Treatment Facilities)	-		
		ii. Operation Trash, Garbage & Cotton Rags	-		
05	Employees Occupational Health	• Satisfactory			
06	Disposal Methods	• Waste Water Effluent Discharged after Neutralization / Treatment.			
07	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)			
08	MISCELLANEOUS FACATORS.				
	i. Spillage of Acid at Demi Plant			Nil	
	ii. Spillage of Caustic at Demi Plant			Nil	
	iii. Spillage of Acid/ Hypo at Cooling Tower			Nil	
	iv. Spillage of Oil			Nil	

Note:-

Waste water of Power Station includes:-

- 99.9% River Water used for Turbine Condenser (Primary Cooling)
- 0.1% Water Treatment Plant and Boiler Blow down Effluent.


 Environment Supervisor
 747 MW CCPP, CPGCL

SOUND LEVEL (dB) OF AT 747MW, CCPP (JULY -2021)

348

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	63		
02	PLC Room (Chemical Section)	74		
03	Work Shop	56		
04	Hydrogen Plant	61		
05	Gas Mixing Station Left side(100m) of Turbine Hall	78		
06	Entrance Gate # 5	64		
07	Hot Water Boiler	62		
08	HSD Tank's Area (Boundary Wall)	64		
09	Gas Conditioning Skid	S/D	75	-
10	Turbine Hall gate b/w HRSG 1&2	83		
*11	Turbine Generator coupling	S/D	116	101
*12	Generator Exciter	S/D	84	97
*13	Turbine Compartment Compressor	S/D	105	104
*14	Combustion Chamber	S/D	107	104
15	Basement	93		
16	Condensate Pump	96		
17	Turbine Hall	90		
18	Turbine Front ST-16	88		
19	Center Control Room	59		
20	ECR	51		
21	Chemical Pump House	83		
22	Fire Fighting Pumps Room	56		
23	Main Pump House	63		
24	Plant Manager /Admin Office	50		
25	Security Post Gate # 4	55		
26	Cooling Tower Area	85		
27	Right side(100m) of Turbine Hall (Near Training Center)	60		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	64		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	63		

Note: -* Enclosed Area
Please use Noise Protective Devices in High Noise areas.


Environmental Supervisor
747 MW CCPP, CPGCL

CHEMICAL ANALYSIS OF EFFLUENT (OUT FALL STREAM)
747 MW,CCPP, GUDDU

Date	Sample	Temp:	pH	TDS	TSS	Iron	Chloride	Chlorine	COD	Sulphate	Ammonia
-	-	°C	-	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
JULY-2021	Out fall	30	7.9	303.9	122	0.082	67.4	0.05	6.42	50	0.22

Note:-

- ◇ TSS of Waste Water is directly related to the Turbidity of River Water.
- ◇ Waste water of Power Station includes:-
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent


Environmental Supervisor
747 MW CCPP, CPGCL

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MONTHLY ENVIRONMENTAL ASSESSMENT CHECKS LIST

PERFORMA

747 MW, CCFP, CPGCL, GENCO-II, GUDDU, AUGUST-2021


350

Sr. No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material		Quantity	
				HRSG I	HRSG II
01	Stack Emission	i. O ₂	%	--	13.06
		ii. CO	ppm	--	0
		iii. CO ₂	%	--	4.50
		iv. Nox	ppm	--	17
		v. Sox	Ppm	--	0
		vi. Temp	°C	--	113.5
02	Water Usage	WATER TREATMENT PLANTS			
03	Liquid Effluent	i. Demi Plant's (Regeneration process) Neutralizing pit		550 m ³	
		ii. Clarifier Drain		Nil	
		GTs & HRSGs			
		i. Sampling Rack Drain		Approx.:650 m ³	
		ii. CCCW System (Close Loop.) Drain		Nil	
		iii. Boiler Blow Down (Main Plant Drain Pit)		Nil	
04	Solid Waste (Pertain to Civil Dept:)	i. Sludge Material (WWTP & Clarification Treatment Facilities)		-	
		ii. Operation Trash, Garbage & Cotton Rags		-	
05	Employees Occupational Health	• Satisfactory			
06	Disposal Methods	• Waste Water Effluent Discharged after Neutralization / Treatment.			
07	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)			
08	MISCELLANEOUS FACATORS.				
	i. Spillage of Acid at Demi Plant			Nil	
	ii. Spillage of Caustic at Demi Plant			Nil	
	iii. Spillage of Acid/ Hypo at Cooling Tower			Nil	
	iv. Spillage of Oil			Nil	

Note:-

Waste water of Power Station includes:-

- 99.9% River Water used for Turbine Condenser (Primary Cooling)
- 0.1% Water Treatment Plant and Boiler Blow down Effluent.


 Environment Supervisor
 747 MW CCFP, CPGCL


SOUND LEVEL (dB) OF AT 747MW, CCPP (AUGUST -2021)

351

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	63		
02	PLC Room (Chemical Section)	74		
03	Work Shop	56		
04	Hydrogen Plant	61		
05	Gas Mixing Station Left side(100m) of Turbine Hall	78		
06	Entrance Gate # 5	64		
07	Hot Water Boiler	62		
08	HSD Tank's Area (Boundary Wall)	64		
09	Gas Conditioning Skid	S/D	75	-
10	Turbine Hall gate b/w HRSG 1&2	83		
*11	Turbine Generator coupling	S/D	116	101
*12	Generator Exciter	S/D	84	97
*13	Turbine Compartment Compressor	S/D	105	104
*14	Combustion Chamber	S/D	107	104
15	Basement	93		
16	Condensate Pump	96		
17	Turbine Hall	90		
18	Turbine Front ST-16	88		
19	Center Control Room	59		
20	ECR	51		
21	Chemical Pump House	83		
22	Fire Fighting Pumps Room	56		
23	Main Pump House	63		
24	Plant Manager /Admin Office	50		
25	Security Post Gate # 4	55		
26	Cooling Tower Area	85		
27	Right side(100m) of Turbine Hall (Near Training Center)	60		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	64		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	63		

Note: -* Enclosed Area

Please use Noise Protective Devices in High Noise areas.



Environment Supervisor
747 MW CCPP, CPGCL

CHEMICAL ANALYSIS OF EFFLUENT (OUT FALL STREAM)
747 MW,CCPP, GUDDU

Date	Sample	Temp:	pH	TDS	TSS	Iron	Chloride	Chlorine	COD	Sulphate	Ammonia
-	-	⁰ C	-	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
AUGUST-2021	Out fall	31	7.9	305.9	120	0.083	65.4	0.06	6.22	48	0.21

Note:-

- ◇ TSS of Waste Water is directly related to the Turbidity of River Water.
- ◇ Waste water of Power Station includes:-
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent


Environment Supervisor
747 MW,CCPP, CPGCL

352

MONTHLY ENVIRONMENTAL ASSESSMENT CHECKS LIST

PERFORMA

747 MW, CCPP, CPGCL, GENCO-II, GUDDU, SEPTEMBER-2021


353

Sr. No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material		Quantity	
				HRSG I	HRSG II
01	Stack Emission	i. O ₂	%	--	13.06
		ii. CO	ppm	--	0
		iii. CO ₂	%	--	4.50
		iv. Nox	ppm	--	15
		v. Sox	Ppm	--	0
		vi. Temp	°C	--	111.5
02	Water Usage	WATER TREATMENT PLANTS			
03	Liquid Effluent	i. Demi Plant's (Regeneration process) Neutralizing pit		450 m ³	
		ii. Clarifier Drain		Nil	
		GTs & HRSGs			
		i. Sampling Rack Drain		Approx.:550 m ³	
		ii. CCCW System (Close Loop.) Drain		Nil	
		iii. Boiler Blow Down (Main Plant Drain Pit)		Nil	
04	Solid Waste (Pertain to Civil Dept:)	i. Sludge Material (WWTP & Clarification Treatment Facilities)		-	
		ii. Operation Trash, Garbage & Cotton Rags		-	
05	Employees Occupational Health	• Satisfactory			
06	Disposal Methods	• Waste Water Effluent Discharged after Neutralization / Treatment.			
07	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)			
08	MISCELLANEOUS FACATORS.				
	i. Spillage of Acid at Demi Plant		Nil		
	ii. Spillage of Caustic at Demi Plant		Nil		
	iii. Spillage of Acid/ Hypo at Cooling Tower		Nil		
	iv. Spillage of Oil		Nil		

Note:-

Waste water of Power Station includes:-

- 99.9% River Water used for Turbine Condenser (Primary Cooling)
- 0.1% Water Treatment Plant and Boiler Blow down Effluent.

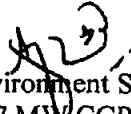

 Environment Supervisor
 747 MW CCPP, CPGCL

CHEMICAL ANALYSIS OF EFFLUENT (OUT FALL STREAM)
747 MW,CCPP, GUDDU

Date	Sample	Temp:	pH	TDS	TSS	Iron	Chloride	Chlorine	COD	Sulphate	Ammonia
-	-	^o C	-	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
SEPTEMBER -2021	Out fall	30	7.9	303.9	122	0.082	67.4	0.05	6.42	50	0.22

Note:-

- ◇ TSS of Waste Water is directly related to the Turbidity of River Water.
- ◇ Waste water of Power Station includes:-
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent


Environment Supervisor
747 MW CCPP, CPGCL

354

SOUND LEVEL (dB) OF AT 747MW, CCPP (SEPTEMBER -2021)

3,55

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	63		
02	PLC Room (Chemical Section)	74		
03	Work Shop	56		
04	Hydrogen Plant	61		
05	Gas Mixing Station Left side(100m) of Turbine Hall	78		
06	Entrance Gate # 5	64		
07	Hot Water Boiler	62		
08	HSD Tank's Area (Boundary Wall)	64		
09	Gas Conditioning Skid	S/D	75	-
10	Turbine Hall gate b/w HRSG 1&2	83		
*11	Turbine Generator coupling	S/D	116	101
*12	Generator Exciter	S/D	84	97
*13	Turbine Compartment Compressor	S/D	105	104
*14	Combustion Chamber	S/D	107	104
15	Basement	93		
16	Condensate Pump	96		
17	Turbine Hall	90		
18	Turbine Front ST-16	88		
19	Center Control Room	59		
20	ECR	51		
21	Chemical Pump House	83		
22	Fire Fighting Pumps Room	56		
23	Main Pump House	63		
24	Plant Manager /Admin Office	50		
25	Security, Post Gate # 4	55		
26	Cooling Tower Area	85		
27	Right side(100m) of Turbine Hall (Near Training Center)	60		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	64		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	63		

Note: -* Enclosed Area

Please use Noise Protective Devices in High Noise areas.

Environment Supervisor
747 MW CCPP, CPGCL

MONTHLY ENVIRONMENTAL ASSESSMENT CHECKS LIST

PERFORMA

747 MW, CCPP, CPGCL, GENCO-II, GUDDU, OCTOBER-2021


356

Sr. No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material		Quantity	
				HRSG I	HRSG II
01	Stack Emission	i. O ₂	%	-	13.22
		ii. CO	ppm	-	0
		iii. CO ₂	%	-	4.41
		iv. Nox	ppm	-	24
		v. Sox	Ppm	-	23
		vi. Temp	°C	-	107
02	Water Usage	WATER TREATMENT PLANTS			
03	Liquid Effluent	i. Demi Plant's (Regeneration process) Neutralizing pit		550 m ³	
		ii. Clarifier Drain		Nil	
		GTs & HRSGs			
		i. Sampling Rack Drain		Approx.:350 m ³	
		ii. CCCW System (Close Loop.) Drain		Nil	
		iii. Boiler Blow Down (Main Plant Drain Pit)		Nil	
iv. Condenser Blow Down (Close Cycle)		Nil			
04	Solid Waste (Pertain to Civil Dept:)	i. Sludge Material (WWTP & Clarification Treatment Facilities)		-	
		ii. Operation Trash, Garbage & Cotton Rags		-	
05	Employees Occupational Health	• Satisfactory			
06	Disposal Methods	• Waste Water Effluent Discharged after Neutralization / Treatment.			
07	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)			
08	MISCELLANEOUS FACATORS.				
	i. Spillage of Acid at Demi Plant		Nil		
	ii. Spillage of Caustic at Demi Plant		Nil		
	iii. Spillage of Acid/ Hypo at Cooling Tower		Nil		
	iv. Spillage of Oil		Nil		

Note:-

Waste water of Power Station includes:-

- 99.9% River Water used for Turbine Condenser (Primary Cooling)
- 0.1% Water Treatment Plant and Boiler Blow down Effluent.


 Environment Supervisor
 747 MW CCPP, CPGCL

SOUND LEVEL (dB) OF AT 747MW, CCPP (October -2020)

357

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	65		
02	PLC Room (Chemical Section)	72		
03	Work Shop	57		
04	Hydrogen Plant	58		
05	Gas Mixing Station Left side(100m) of Turbine Hall	76		
06	Entrance Gate # 5	63		
07	Hot Water Boiler	60		
08	HSD Tank's Area (Boundary Wall)	60		
09	Gas Conditioning Skid	S/D	74	-
10	Turbine Hall gate b/w HRSG 1&2	83		
*11	Turbine Generator coupling	S/D	116	101
*12	Generator Exciter	S/D	86	96
*13	Turbine Compartment Compressor	S/D	105	104
*14	Combustion Chamber	S/D	107	104
15	Basement	95		
16	Condensate Pump	96		
17	Turbine Hall	88		
18	Turbine Front ST-16	89		
19	Center Control Room	57		
20	ECR	50		
21	Chemical Pump House	78		
22	Fire Fighting Pumps Room	54		
23	Main Pump House	62		
24	Plant Manager /Admin Office	48		
25	Security Post Gate # 4	50		
26	Cooling Tower Area	87		
27	Right side(100m) of Turbine Hall (Near Training Center)	62		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	62		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	65		

Note: -* Enclosed Area

Please use Noise Protective Devices in High Noise areas.


Environmental Supervisor
747 MW CCPP, CPGCL

CHEMICAL ANALYSIS OF EFFLUENT (OUT FALL STREAM)
747 MW,CCPP, GUDDU

Date	Sample	Temp:	pH	TDS	TSS	Iron	Chloride	Chlorine	COD	Sulphate	Ammonia
-	-	°C	-	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
OCTOBER -2021	Out fall	29	7.9	306.9	125	0.086	64.4	0.04	6.30	48	0.20

Note:-

- ◇ TSS of Waste Water is directly related to the Turbidity of River Water.
- ◇ Waste water of Power Station includes:-
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent


Environmental Supervisor
747 MW CCPP, CPGCL

358

MONTHLY ENVIRONMENTAL ASSESSMENT CHECKS LIST
PERFORMA"

747 MW, CCPP, CPGCL, GENCO-II, GUDDU, NOVEMBER-2021


359

Sr. No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material		Quantity	
				HRSG I	HRSG II
01	Stack Emission	i. O ₂	%		13.26
		ii. CO	ppm		0
		iii. CO ₂	%		4.43
		iv. Nox	ppm		17
		v. Sox	Ppm		0
		vi. Temp	°C		110
02	Water Usage	WATER TREATMENT PLANTS			
03	Liquid Effluent	i. Demi Plant's (Regeneration process) Neutralizing pit		900 m ³	
		ii. Clarifier Drain		Nil	
		GTs & HRSGs			
		i. Sampling Rack Drain		Approx.:350 m ³	
		ii. CCCW System (Close Loop.) Drain		Nil	
		iii. Boiler Blow Down (Main Plant Drain Pit)		Nil	
04	Solid Waste (Pertain to Civil Dept:)	i. Sludge Material (WWTP & Clarification Treatment Facilities)		-	
		ii. Operation Trash, Garbage & Cotton Rags		-	
05	Employees Occupational Health	• Satisfactory			
06	Disposal Methods	• Waste Water Effluent Discharged after Neutralization / Treatment.			
07	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)			
08	MISCELLANEOUS FACATORS.				
	i. Spillage of Acid at Demi Plant			Nil	
	ii. Spillage of Caustic at Demi Plant			Nil	
	iii. Spillage of Acid/ Hypo at Cooling Tower			Nil	
	iv. Spillage of Oil			Nil	

Note:-

Waste water of Power Station includes:-

- 99.9% River Water used for Turbine Condenser (Primary Cooling)
- 0.1% Water Treatment Plant and Boiler Blow down Effluent.


 Environment Supervisor
 747 MW CCPP, CPGCL

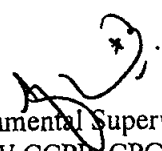
SOUND LEVEL (dB) OF AT 747MW, CCPP (NOVEMBER-2021)

360

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	61		
02	PLC Room (Chemical Section)	68		
03	Work Shop	57		
04	Hydrogen Plant	58		
05	Gas Mixing Station Left side(100m) of Turbine Hall	75		
06	Entrance Gate # 5	62		
07	Hot Water Boiler	62		
08	HSD Tank's Area (Boundary Wall)	60		
09	Gas Conditioning Skid	S/D	75	-
10	Turbine Hall gate b/w HRSG 1&2	85		
*11	Turbine Generator coupling	S/D	115	103
*12	Generator Exciter	S/D	87	98
*13	Turbine Compartment Compressor	S/D	106	105
*14	Combustion Chamber	S/D	108	104
15	Basement	94		
16	Condensate Pump	98		
17	Turbine Hall	87		
18	Turbine Front ST-16	88		
19	Center Control Room	56		
20	ECR	51		
21	Chemical Pump House	72		
22	Fire Fighting Pumps Room	55		
23	Main Pump House	60		
24	Plant Manager /Admin Office	48		
25	Security Post Gate # 4	52		
26	Cooling Tower Area	86		
27	Right side(100m) of Turbine Hall (Near Training Center)	64		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	63		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	66		

Note: -* Enclosed Area

Please use Noise Protective Devices in High Noise areas.



Environmental Supervisor
747 MW CCPP, CPGCL

CHEMICAL ANALYSIS OF EFFLUENT (OUT FALL STREAM)

747 MW,CCPP, GUDDU

Date	Sample	Temp:	pH	TDS	TSS	Iron	Chloride	Chlorine	COD	Sulphate	Ammonia
-	-	^o C	-	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
NOVEMBER - 2021	Out fall	28	8.1	178	125	0.086	19.6	0.06	6.58	52	0.24

Note:-

- ◇ TSS of Waste Water is directly related to the Turbidity of River Water.
- ◇ Waste water of Power Station includes:-
 - Once through mode (Open Cycle)
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent


Environmental Supervisor
747 MW CCPP, CPGCL

361

MONTHLY ENVIRONMENTAL ASSESSMENT CHECKS LIST
PERFORMA"

747 MW, CCPP, CPGCL, GENCO-II, GUDDU, DECEMBER-2021


362

Sr. No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material		Quantity	
				HRSG I	HRSG II
01	Stack Emission	i. O ₂	%	--	13.30
		ii. CO	ppm	--	0
		iii. CO ₂	%	--	4.34
		iv. Nox	ppm	--	20
		v. Sox	Ppm	--	0
		vi. Temp	°C	--	108.0
02	Water Usage	WATER TREATMENT PLANTS			
03	Liquid Effluent	i. Demi Plant's (Regeneration process) Neutralizing pit		800 m ³	
		ii. Clarifier Drain		Nil	
		GTs & HRSGs			
		i. Sampling Rack Drain		Approx.:300 m ³	
		ii. CCCW System (Close Loop.) Drain		Nil	
		iii. Boiler Blow Down (Main Plant Drain Pit)		Nil	
04	Solid Waste (Pertain to Civil Dept.:	i. Sludge Material (WWTP & Clarification Treatment Facilities)		-	
		ii. Operation Trash, Garbage & Cotton Rags		-	
05	Employees Occupational Health	• Satisfactory			
06	Disposal Methods	• Waste Water Effluent Discharged after Neutralization / Treatment.			
07	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)			
08	MISCELLANEOUS FACATORS.				
	i. Spillage of Acid at Demi Plant			Nil	
	ii. Spillage of Caustic at Demi Plant			Nil	
	iii. Spillage of Acid/ Hypo at Cooling Tower			Nil	
	iv. Spillage of Oil			Nil	

Note:-

Waste water of Power Station includes:-

- 99.9% River Water used for Turbine Condenser (Primary Cooling)
- 0.1% Water Treatment Plant and Boiler Blow down Effluent.


 Environment Supervisor
 747 MW CCPP, CPGCL


SOUND LEVEL (dB) OF AT 747MW, CCPP (December-2021)

363

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	62		
02	PLC Room (Chemical Section)	72		
03	Work Shop	58		
04	Hydrogen Plant	57		
05	Gas Mixing Station Left side(100m) of Turbine Hall	79		
06	Entrance Gate # 5	64		
07	Hot Water Boiler	62		
08	HSD Tank's Area (Boundary Wall)	63		
09	Gas Conditioning Skid	S/D	74	-
10	Turbine Hall gate b/w HRSG 1&2	85		
*11	Turbine Generator coupling	S/D	115	103
*12	Generator Exciter	S/D	87	98
*13	Turbine Compartment Compressor	S/D	106	105
*14	Combustion Chamber	S/D	108	104
15	Basement	95		
16	Condensate Pump	97		
17	Turbine Hall	88		
18	Turbine Front ST-16	89		
19	Center Control Room	55		
20	ECR	52		
21	Chemical Pump House	73		
22	Fire Fighting Pumps Room	57		
23	Main Pump House	62		
24	Plant Manager /Admin Office	49		
25	Security Post Gate # 4	52		
26	Cooling Tower Area	84		
27	Right side(100m) of Turbine Hall (Near Training Center)	65		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	65		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	67		

Note: -* Enclosed Area

Please use Noise Protective Devices in High Noise areas.



 Environmental Supervisor
 747 MW CCPP, CPGCL

CHEMICAL ANALYSIS OF EFFLUENT (OUT FALL STREAM)
747 MW,CCPP, GUDDU

Date	Sample	Temp:	pH	TDS	TSS	Iron	Chloride	Chlorine	COD	Sulphate	Ammonia
-	-	°C	-	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
DECEMBER -2021	Out fall	28	7.8	304.5	122	0.084	62.5	0.05	6.25	47	0.25

Note:-

- ◇ TSS of Waste Water is directly related to the Turbidity of River Water.
- ◇ Waste water of Power Station includes:-
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent


Environmental Supervisor
747 MW CCPP, CPGCL

369

CHEMICAL ANALYSIS OF EFFLUENT (OUT FALL STREAM)

747 MW,CCPP, GUDDU

Date	Sample	Temp:	pH	TDS	TSS	Iron	Chloride	Chlorine	COD	Sulphate	Ammonia
-	-	^o C	-	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
JANUARY -2022	Out fall	29	7.9	306.5	120	0.082	60.5	0.04	6.15	45	0.23

0

Note:-

- ◇ TSS of Waste Water is directly related to the Turbidity of River Water.
- ◇ Waste water of Power Station includes:-
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent


Environmental Supervisor
747 MW CCPP, CPGCL

365

**MONTHLY ENVIRONMENTAL ASSESSMENT CHECKS LIST"
PERFORMA"**

747 MW, CCPP, CPGCL, GENCO-II, GUDDU, JANUARY-2022

366

Sr. No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material		Quantity	
				HRSG I	HRSG II
01	Stack Emission	i. O ₂	%	--	13.29"
		ii. CO	ppm	--	0
		iii. CO ₂	%	--	4.37
		iv. Nox	ppm	--	21
		v. Sox	Ppm	--	0
		vi. Temp	°C	--	105.6
02	Water Usage	WATER TREATMENT PLANTS			
03	Liquid Effluent	i. Demi Plant's (Regeneration process) Neutralizing pit		750 m ³	
		ii. Clarifier Drain		Nil	
		GTs & HRSGs			
		i. Sampling Rack Drain		Approx.:250 m ³	
		ii. CCCW System (Close Loop.) Drain		Nil	
		iii. Boiler Blow Down (Main Plant Drain Pit)		Nil	
04	Solid Waste (Pertain to Civil Dept.:)	i. Sludge Material (WWTP & Clarification Treatment Facilities)		-	
		ii. Operation Trash, Garbage & Cotton Rags		-	
05	Employees Occupational Health	• Satisfactory			
06	Disposal Methods	• Waste Water Effluent Discharged after Neutralization / Treatment.			
07	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)			
08	MISCELLANEOUS FACATORS.				
	i. Spillage of Acid at Demi Plant			Nil	
	ii. Spillage of Caustic at Demi Plant			Nil	
	iii. Spillage of Acid/ Hypo at Cooling Tower			Nil	
	iv. Spillage of Oil			Nil	

Note:-

Waste water of Power Station includes:-

- 99.9% River Water used for Turbine Condenser (Primary Cooling)
- 0.1% Water Treatment Plant and Boiler Blow down Effluent.

Environment Supervisor
747 MW CCPP, CPGCL

SOUND LEVEL (dB) OF AT 747MW, CCPP (January -2022)

367

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	67		
02	PLC Room (Chemical Section)	58		
03	Work Shop	61		
04	Hydrogen Plant	64		
05	Gas Mixing Station Left side(100m) of Turbine Hall	77		
06	Entrance Gate # 5	85		
07	Hot Water Boiler	86		
08	HSD Tank's Area (Boundary Wall)	70		
09	Gas Conditioning Skid	S/D	104	-
10	Turbine Hall gate b/w HRSG 1&2	93		
*11	Turbine Generator coupling	S/D	106	106
*12	Generator Exciter	S/D	94	104
*13	Turbine Compartment Compressor	S/D	110	-
*14	Combustion Chamber	S/D	104	-
15	Basement	94		
16	Condensate Pump	95		
17	Turbine Hall	90		
18	Turbine Front ST-16	88		
19	Center Control Room	56		
20	ECR	52		
21	Chemical Pump House	82		
22	Fire Fighting Pumps Room	55		
23	Main Pump House	91		
24	Plant Manager /Admin Office	52		
25	Security Post Gate # 4	63		
26	Cooling Tower Area	78		
27	Right side(100m) of Turbine Hall (Near Training Center)	76		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	61		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	63		

Note: -* Enclosed Area

Please use Noise Protective Devices in High Noise areas.

Environmental Supervisor
747 MW CCPP, CPGCL

MONTHLY ENVIRONMENTAL ASSESSMENT CHECKS LIST

PERFORMA

747 MW, CCPP, CPGCL, GENCO-II, GUDDU, FEBUARY -2022


368

Sr. No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material		Quantity	
				HRSG I	HRSG II
01	Stack Emission	i. O ₂	%		13.19
		ii. CO	ppm		3.0
		iii. CO ₂	%		4.42
		iv. Nox	ppm		16.0
		v. Sox	ppm		0.0
		vi. Temp	°C		111.8
02	Water Usage	WATER TREATMENT PLANTS			
03	Liquid Effluent	i. Demi Plant's (Regeneration process) Neutralizing pit		700 m ³	
		ii. Clarifier Drain		Nil	
		GTs & HRSGs			
		i. Sampling Rack Drain		Approx.: 600 m ³	
		ii. CCCW System (Close Loop.) Drain		Nil	
		iii. Boiler Blow Down (Main Plant Drain Pit)		Nil	
04	Solid Waste (Pertain to Civil Dept:)	i. Sludge Material (WWTP & Clarification Treatment Facilities)		-	
		ii. Operation Trash, Garbage & Cotton Rags		-	
05	Employees Occupational Health	• Satisfactory			
06	Disposal Methods	• Waste Water Effluent Discharged after Neutralization / Treatment.			
07	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)			
08	MISCELLANEOUS FACATORS.				
	i. Spillage of Acid at Demi Plant			Nil	
	ii. Spillage of Caustic at Demi Plant			Nil	
	iii. Spillage of Acid/ Hypo at Cooling Tower			Nil	
	iv. Spillage of Oil			Nil	

Note:-

Waste water of Power Station includes:-

- 99.9% River Water used for Turbine Condenser (Primary Cooling)
- 0.1% Water Treatment Plant and Boiler Blow down Effluent.


 Environmental Supervisor
 747 MW CCPP, CPGCL

SOUND LEVEL (dB) OF AT 747MW, CCPP (February , 2022)

369

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	62		
02	PLC Room (Chemical Section)	58		
03	Work Shop	63		
04	Hydrogen Plant	60		
05	Gas Mixing Station Left side(100m) of Turbine Hall	75		
06	Entrance Gate # 5	64		
07	Hot Water Boiler	68		
08	HSD Tank's Area (Boundary Wall)	64		
09	Gas Conditioning Skid	S/D	80	
10	Turbine Hall gate b/w HRSG 1&2	83		
*11	Turbine Generator coupling	S/D	112	95
*12	Generator Exciter	S/D	94	92
*13	Turbine Compartment Compressor	S/D	104	
*14	Combustion Chamber	S/D	105	
15	Basement	85		
16	Condensate Pump	93		
17	Turbine Hall	88		
18	Turbine Front ST-16	86		
19	Center Control Room	58		
20	ECR	57		
21	Chemical Pump House	61		
22	Fire Fighting Pumps Room	59		
23	Main Pump House	63		
24	Plant Manager /Admin Office	50		
25	Security Post Gate # 4	55		
26	Cooling Tower Area	58		
27	Right side(100m) of Turbine Hall (Near Training Center)	68		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	70		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	68		

Note: -* Enclosed Area

Please use Noise Protective Devices in High Noise areas.

Environmental Supervisor
747 MW CCPP, CPGCL

CHEMICAL ANALYSIS OF EFFLUENT (OUT FALL STREAM)

747 MW,CCPP, GUDDU

Date	Sample	Temp:	pH	TDS	TSS	Iron	Chloride	Chlorine	COD	Sulphate	Ammonia
-	-	^o C	-	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
February - 2022	Out fall	24	8.6	250	275	0.086	27.69	0.074	8.16	55.0	0.258

Note:-

- ◇ TSS of Waste Water is directly related to the Turbidity of River Water.
- ◇ Waste water of Power Station includes:-
 - Once through mode (Open Cycle)
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent


Environmental Supervisor
747 MW,CCPP, CPGL

MONTHLY ENVIRONMENTAL ASSESSMENT CHECKS LIST

PERFORMA

747 MW, CCPP, CPGCL, GENCO-II, GUDDU, MARCH-2022


371

Sr. No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material		Quantity	
				HRSG I	HRSG II
01	Stack Emission	i. O ₂	%	--	13.52
		ii. CO	ppm	--	0
		iii. CO ₂	%	--	4.24
		iv. Nox	ppm	--	19
		v. Sox	Ppm	--	0
		vi. Temp	°C	--	105.2
02	Water Usage	WATER TREATMENT PLANTS			
03	Liquid Effluent	i. Demi Plant's (Regeneration process) Neutralizing pit		800 m ³	
		ii. Clarifier Drain		Nil	
		GTs & HRSGs			
		i. Sampling Rack Drain		Approx.:300 m ³	
		ii. CCCW System (Close Loop.) Drain		Nil	
		iii. Boiler Blow Down (Main Plant Drain Pit)		Nil	
iv. Condenser Blow Down (Close Cycle)		Nil			
04	Solid Waste (Pertain to Civil Dept. :)	i. Sludge Material (WWTP & Clarification Treatment Facilities)		-	
		ii. Operation Trash, Garbage & Cotton Rags		-	
05	Employees Occupational Health	• Satisfactory			
06	Disposal Methods	• Waste Water Effluent Discharged after Neutralization / Treatment.			
07	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)			
08	MISCELLANEOUS FACATORS.				
	i. Spillage of Acid at Demi Plant		Nil		
	ii. Spillage of Caustic at Demi Plant		Nil		
	iii. Spillage of Acid/ Hypo at Cooling Tower		Nil		
	iv. Spillage of Oil		Nil		

Note:-

Waste water of Power Station includes:-

- 99.9% River Water used for Turbine Condenser (Primary Cooling)
- 0.1% Water Treatment Plant and Boiler Blow down Effluent.


 Environment Supervisor
 747 MW CCPP, CPGCL

CHEMICAL ANALYSIS OF EFFLUENT (OUT FALL STREAM)


747 MW,CCPP, GUDDU

Date	Sample	Temp:	pH	TDS	TSS	Iron	Chloride	Chlorine	COD	Sulphate	Ammonia
-	-	°C	-	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
MARCH-2022	Out fall	31	7.9	308.5	122	0.080	58.5	0.05	6.25	48	0.25

0

Note:-

- ◇ TSS of Waste Water is directly related to the Turbidity of River Water.
- ◇ Waste water of Power Station includes:-
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent


Environmental Supervisor
747 MW CCPP, CPGCL

MONTHLY ENVIRONMENTAL ASSESSMENT CHECKS LIST
PERFORMA"

747 MW, CCPP, CPGCL, GENCO-II, GUDDU, APRIL -2022

373

Sr. No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material		Quantity	
				HRSG I	HRSG II
01	Stack Emission	i. O ₂	%		13.15
		ii. CO	ppm		0
		iii. CO ₂	%		4.45
		iv. Nox	ppm		19
		v. Sox	ppm		0
		vi. Temp	°C		109
02	Water Usage	WATER TREATMENT PLANTS			
03	Liquid Effluent	i. Demi Plant's (Regeneration process) Neutralizing pit		950 m ³	
		ii. Clarifier Drain		Nil	
		GTs & HRSGs			
		i. Sampling Rack Drain		Approx.: 600 m ³	
		ii. CCCW System (Close Loop.) Drain		Nil	
		iii. Boiler Blow Down (Main Plant Drain Pit)		Nil	
		iv. Condenser Blow Down (Close Cycle)		Nil	
04	Solid Waste (Pertain to Civil Dept:)	i. Sludge Material (WWTP & Clarification Treatment Facilities)		-	
		ii. Operation Trash, Garbage & Cotton Rags		-	
05	Employees Occupational Health	• Satisfactory			
06	Disposal Methods	• Waste Water Effluent Discharged after Neutralization / Treatment.			
07	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)			
08	MISCELLANEOUS FACATORS.				
	i. Spillage of Acid at Demi Plant		Nil		
	ii. Spillage of Caustic at Demi Plant		Nil		
	iii. Spillage of Acid/ Hypo at Cooling Tower		Nil		
	iv. Spillage of Oil		Nil		

Note:-

Waste water of Power Station includes:-

- 99.9% River Water used for Turbine Condenser (Primary Cooling)
- 0.1% Water Treatment Plant and Boiler Blow down Effluent.


Environmental Supervisor
747 MW CCPP, CPGCL

SOUND LEVEL (dB) OF AT 747MW, CCPP (April-2022)

374

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	73		
02	PLC Room (Chemical Section)	63.5		
03	Work Shop	63		
04	Hydrogen Plant	61		
05	Gas Mixing Station Left side(100m) of Turbine Hall	66		
06	Entrance Gate # 5	67		
07	Hot Water Boiler	65		
08	HSD Tank's Area (Boundary Wall)	66		
09	Gas Conditioning Skid	S/D	80	
10	Turbine Hall gate b/w HRSG 1&2	86		
*11	Turbine Generator coupling	S/D	114	95.5
*12	Generator Exciter	S/D	92	92
*13	Turbine Compartment Compressor	S/D	104	
*14	Combustion Chamber	S/D	107	
15	Basement	90		
16	Condensate Pump	92		
17	Turbine Hall	89.4		
18	Turbine Front ST-16	87.6		
19	Center Control Room	55		
20	ECR	56		
21	Chemical Pump House	62		
22	Fire Fighting Pumps Room	60		
23	Main Pump House	64		
24	Plant Manager /Admin Office	48		
25	Security Post Gate # 4	56		
26	Cooling Tower Area	58		
27	Right side(100m) of Turbine Hall (Near Training Center)	66		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	70		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	69		

Note: -* Enclosed Area

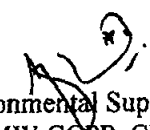

 Environmental Supervisor
 747 MW CCPP, CPGCL

375

Date	Sample	Temp:	pH	TDS	TSS	Iron	Chloride	Chlorine	COD	Sulphate	Ammonia
-	-	°C	-	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
April - 2022	Out fall	26	8.17	3436	60	0.19	1175	35	8.8	48	0.320

Note:-

- ◇ TSS of Waste Water is directly related to the Turbidity of River Water.
- ◇ Waste water of Power Station includes:-
 - Once through mode (Open Cycle)
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent


Environmental Supervisor
747 MW CCPP, CPGCL

ENVIRONMENTAL ASSESSMENT CHECKS LIST
PERFORMA
747 MW, CCPP, CPGCL, GENCO-II, GUDDU, MAY -2022


376

Sr. No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material		Quantity	
				HRSG I	HRSG II
01	Stack Emission	i. O ₂	%		13.15
		ii. CO	ppm		0
		iii. CO ₂	%		4.45
		iv. Nox	ppm		19
		v. Sox	ppm		0
		vi. Temp	°C		109
02	Water Usage	WATER TREATMENT PLANTS			
03	Liquid Effluent	i. Demi Plant's (Regeneration process) Neutralizing pit		850 m ³	
		ii. Clarifier Drain		Nil	
		GTs & HRSGs			
		i. Sampling Rack Drain		Approx.: 450 m ³	
		ii. CCCW System (Close Loop.) Drain		Nil	
		iii. Boiler Blow Down (Main Plant Drain Pit)		Nil	
04	Solid Waste (Pertain to Civil Dept:)	i. Sludge Material (WWTP & Clarification Treatment Facilities)		-	
		ii. Operation Trash, Garbage & Cotton Rags		-	
05	Employees Occupational Health	• Satisfactory			
06	Disposal Methods	• Waste Water Effluent Discharged after Neutralization / Treatment.			
07	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)			
08	MISCELLANEOUS FACATORS.				
	i. Spillage of Acid at Demi Plant		Nil		
	ii. Spillage of Caustic at Demi Plant		Nil		
	iii. Spillage of Acid/ Hypo at Cooling Tower		Nil		
	iv. Spillage of Oil		Nil		

Note:-

Waste water of Power Station includes:-

- 99.9% River Water used for Turbine Condenser (Primary Cooling)
- 0.1% Water Treatment Plant and Boiler Blow down Effluent.


 Environmental Supervisor
 747 MW CCPP, CPGCL

377

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	73		
02	PLC Room (Chemical Section)	63.5		
03	Work Shop	63		
04	Hydrogen Plant	61		
05	Gas Mixing Station Left side(100m) of Turbine Hall	66		
06	Entrance Gate # 5	67		
07	Hot Water Boiler	65		
08	HSD Tank's Area (Boundary Wall)	66		
09	Gas Conditioning Skid	S/D	80	
10	Turbine Hall gate b/w HRSG 1&2	86		
*11	Turbine Generator coupling	S/D	114	95.5
*12	Generator Exciter	S/D	92	92
*13	Turbine Compartment Compressor	S/D	104	
*14	Combustion Chamber	S/D	107	
15	Basement	90		
16	Condensate Pump	92		
17	Turbine Hall	89.4		
18	Turbine Front ST-16	87.6		
19	Center Control Room	55		
20	ECR	56		
21	Chemical Pump House	62		
22	Fire Fighting Pumps Room	60		
23	Main Pump House	64		
24	Plant Manager /Admin Office	48		
25	Security Post Gate # 4	56		
26	Cooling Tower Area	58		
27	Right side(100m) of Turbine Hall (Near Training Center)	66		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	70		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	69		

Note: -* Enclosed Area
Please use Noise Protective Devices in High Noise areas.

Environmental Supervisor
747 MW CCPP, CBCC


878
378

CHEMICAL ANALYSIS OF EFFLUENT (OUT FALL STREAM)
747 MW,CCPP, GUDDU

Date	Sample	Temp:	pH	TDS	TSS	Iron	Chloride	Chlorine	COD	Sulphate	Ammonia
-	-	^o C	-	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
May - 2022	Out fall	29	8.22	3140	68	0.18	1044	32	8.92	56	0.228

Note:-

- ◇ TSS of Waste Water is directly related to the Turbidity of River Water.
- ◇ Waste water of Power Station includes:-
 - Once through mode (Open Cycle)
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent


Environmental Supervisor
747 MW CCPP, CPGCL


CHEMICAL ANALYSIS OF EFFLUENT (OUT FALL STREAM)

747 MW,CCPP, GUDDU

Date	Sample	Temp:	pH	TDS	TSS	Iron	Chloride	Chlorine	COD	Sulphate	Ammonia
-	-	^o C	-	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
June -2022	Out fall	38	8.3	210	68	0.086	23.08	0.07	6.22	52	0.208

Note:-

- ◇ TSS of Waste Water is directly related to the Turbidity of River Water.
- ◇ Waste water of Power Station includes:-
 - Once through mode (Open Cycle)
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent


Environmental Supervisor
747 MW CCPP, CPGCL

379

**"ENVIRONMENTAL ASSESSMENT CHECKS LIST"
PERFORMA"
747 MW, CCPP, CPGCL, GENCO-II, GUDDU, JUNE -2022**


380

Sr. No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material		Quantity		
				HRSG I	HRSG II	
01	Stack Emission	i. O ₂	%		13.20	
		ii. CO	ppm		0	
		iii. CO ₂	%		4.53	
		iv. Nox	ppm		18	
		v. Sox	Ppm		0	
		vi. Temp	°C		110	
02	Water Usage	WATER TREATMENT PLANTS				
03	Liquid Effluent	i. Demi Plant's (Regeneration process) Neutralizing pit				650 m ³
		ii. Clarifier Drain				Nil
		GTs & HRSGs				
		i. Sampling Rack Drain				Approx. :400 m ³
		ii. CCCW System (Close Loop.) Drain				Nil
		iii. Boiler Blow Down (Main Plant Drain Pit)				Nil
04	Solid Waste (Pertain to Civil Dept:)	i. Sludge Material (WWTP & Clarification Treatment Facilities)				-
		ii. Operation Trash, Garbage & Cotton Rags				-
05	Employees Occupational Health	• Satisfactory				
06	Disposal Methods	• Waste Water Effluent Discharged after Neutralization / Treatment.				
07	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)				
08	MISCELLANEOUS FACATORS.					
	i. Spillage of Acid at Demi Plant			Nil		
	ii. Spillage of Caustic at Demi Plant			Nil		
	iii. Spillage of Acid/ Hypo at Cooling Tower			Nil		
	iv. Spillage of Oil			Nil		

Note:-

Waste water of Power Station includes:-

- 99.9% River Water used for Turbine Condenser (Primary Cooling)
- 0.1% Water Treatment Plant and Boiler Blow down Effluent.


 Environmental Supervisor
 747 MW CCPP, CPGCL

SOUND LEVEL (dB) OF AT 747MW, CCPP (JUNE-2022)

381

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	67		
02	PLC Room (Chemical Section)	60.5		
03	Work Shop	62		
04	Hydrogen Plant	59		
05	Gas Mixing Station Left side(100m) of Turbine Hall	68		
06	Entrance Gate # 5	69		
07	Hot Water Boiler	68		
08	HSD Tank's Area (Boundary Wall)	65		
09	Gas Conditioning Skid	S/D	79	
10	Turbine Hall gate b/w HRSG 1&2	84		
*11	Turbine Generator coupling	S/D	115	97.5
*12	Generator Exciter	S/D	93	93
*13	Turbine Compartment Compressor	S/D	106	
*14	Combustion Chamber	S/D	108	
15	Basement	91		
16	Condensate Pump	93		
17	Turbine Hall	87.4		
18	Turbine Front ST-16	85.6		
19	Center Control Room	54		
20	ECR	56		
21	Chemical Pump House	62		
22	Fire Fighting Pumps Room	60		
23	Main Pump House	60		
24	Plant Manager /Admin Office	47		
25	Security Post Gate # 4	54		
26	Cooling Tower Area	56		
27	Right side(100m) of Turbine Hall (Near Training Center)	65		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	69		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	70		

Note: -* Enclosed Area

Please use Noise Protective Devices in High Noise areas.

Environmental Supervisor
747 MW CCPP, CPGCL

SOUND LEVEL (dB) OF AT 747MW, CCPP (July -2022)

382

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	67		
02	PLC Room (Chemical Section)	58		
03	Work Shop	61		
04	Hydrogen Plant	64		
05	Gas Mixing Station Left side(100m) of Turbine Hall	77		
06	Entrance Gate # 5	85		
07	Hot Water Boiler	86		
08	HSD Tank's Area (Boundary Wall)	70		
09	Gas Conditioning Skid	105	104	-
10	Turbine Hall gate b/w HRSG 1&2	93		
*11	Turbine Generator coupling	105	106	S/D
*12	Generator Exciter	95	94	S/D
*13	Turbine Compartment Compressor	111	110	-
*14	Combustion Chamber	102	103	-
15	Basement	94		
16	Condensate Pump	86		
17	Turbine Hall	85		
18	Turbine Front ST-16	78		
19	Center Control Room	52		
20	ECR	50		
21	Chemical Pump House	82		
22	Fire Fighting Pumps Room	55		
23	Main Pump House	85		
24	Plant Manager /Admin Office	50		
25	Security Post Gate # 4	63		
26	Cooling Tower Area	77		
27	Right side(100m) of Turbine Hall (Near Training Center)	76		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	61		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	63		

Note: -

- Normal limits (85 dB, Sound -meter at 7.5 meter from the source)
- *Enclosed Area

Please use Noise Protective Devices in High Noise areas.


Environmental Supervisor
747 MW CCPP, CPGCL

SOUND LEVEL (dB) OF AT 747MW, CCPP (August-2022)

283

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	64		
02	PLC Room (Chemical Section)	64.5		
03	Work Shop	66		
04	Hydrogen Plant	62		
05	Gas Mixing Station Left side(100m) of Turbine Hall	65		
06	Entrance Gate # 5	67		
07	Hot Water Boiler	68		
08	HSD Tank's Area (Boundary Wall)	65		
09	Gas Conditioning Skid	74	77	
10	Turbine Hall gate b/w HRSG 1&2	85		
*11	Turbine Generator coupling	109	114	S/D
*12	Generator Exciter	93	94	S/D
*13	Turbine Compartment Compressor	104	106	
*14	Combustion Chamber	105	106	
15	Basement	93		
16	Condensate Pump	84		
17	Turbine Hall	86.4		
18	Turbine Front ST-16	79		
19	Center Control Room	56		
20	ECR	55		
21	Chemical Pump House	59		
22	Fire Fighting Pumps Room	60		
23	Main Pump House	58		
24	Plant Manager /Admin Office	49		
25	Security Post Gate # 4	54		
26	Cooling Tower Area	53		
27	Right side(100m) of Turbine Hall (Near Training Center)	67		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	68		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	70		

Note: -* Enclosed Area

Please use Noise Protective Devices in High Noise areas.



Environmental Supervisor
747 MW CCPP, CPGCL

SOUND LEVEL (dB) OF AT 747MW, CCPP (September-2022)

384

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	70		
02	PLC Room (Chemical Section)	62.0		
03	Work Shop	60		
04	Hydrogen Plant	58		
05	Gas Mixing Station Left side(100m) of Turbine Hall	65.8		
06	Entrance Gate # 5	64.		
07	Hot Water Boiler	66		
08	HSD Tank's Area (Boundary Wall)	66		
09	Gas Conditioning Skid	76.5	78	-
10	Turbine Hall gate b/w HRSG 1&2	90.4		
*11	Turbine Generator coupling	91	93	S/D
*12	Generator Exciter	90	92	S/D
*13	Turbine Compartment Compressor	115	113	-
*14	Combustion Chamber	109	111	-
15	Basement	91		
16	Condensate Pump	84		
17	Turbine Hall	90		
18	Turbine Front ST-16	78		
19	Center Control Room	49		
20	ECR	51		
21	Chemical Pump House	83.7		
22	Fire Fighting Pumps Room	55.7		
23	Main Pump House	87		
24	Plant Manager /Admin Office	48		
25	Security Post Gate # 4	58		
26	Cooling Tower Area	55		
27	Right side(100m) of Turbine Hall (Near Training Center)	66.9		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	64.5		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	64.3		

Note: -* Enclosed Area

Please use Noise Protective Devices in High Noise areas.


 Environmental Supervisor
 747 MW CCPP, CPGCL


SOUND LEVEL (dB) OF AT 747MW, CCPP (OCTOBER -2022)

385
1"

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	67		
02	PLC Room (Chemical Section)	62		
03	Work Shop	59		
04	Hydrogen Plant	60		
05	Gas Mixing Station Left side(100m) of Turbine Hall	65		
06	Entrance Gate # 5	68		
07	Hot Water Boiler	72		
08	HSD Tank's Area (Boundary Wall)	66		
09	Gas Conditioning Skid	86	83	-
10	Turbine Hall gate b/w HRSG 1&2	88		
*11	Turbine Generator coupling	122	116	S/D
*12	Generator Exciter	93	92	S/D
*13	Turbine Compartment Compressor	105	105	-
*14	Combustion Chamber	109	110	-
15	Basement	95		
16	Condensate Pump	87		
17	Turbine Hall	87.8		
18	Turbine Front ST-16	79		
19	Center Control Room	58		
20	ECR	48		
21	Chemical Pump House	58		
22	Fire Fighting Pumps Room	51		
23	Main Pump House	80		
24	Plant Manager /Admin Office	51		
25	Security Post Gate # 4	58		
26	Cooling Tower Area	55		
27	Right side(100m) of Turbine Hall (Near Training Center)	67		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	64		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	63		

Note: -* Enclosed Area

Please use Noise Protective Devices in High Noise areas.


 Environmental Supervisor
 747 MW CCPP, CPGL

Sr. No	Factors Affecting the Natural Environment	Fuel/Pollutants/ Waste Material		Quantity		
			Standard	Standard	HRSG I	HRSG II
01	Stack Emission	i. O ₂		%	--	--
		ii. CO	698.33	ppm	--	--
		iii. CO ₂		%	--	--
		iv. Nox	212.56	ppm	--	--
		v. Sox	400 nm	Ppm	--	--
		vi. Temp	232	°C	--	--
02	Water Usage	WATER TREATMENT PLANTS				
03	Liquid Effluent	i. Demi Plant's (Regeneration process) Neutralizing pit		150 m ³ / Month		
		ii. Clarifier Drain		Nil		
		GTs & HRSGs				
		i. Sampling Rack Drain		Approx.:00 m ³ / Month		
		ii. CCCW System (Close Loop.) Drain		Nil		
		iii. Boiler Blow Down (Main Plant Drain Pit)		Nil		
04	Solid Waste (Pertain to Civil Dept. :)	i. Sludge Material (WWTP & Clarification Treatment Facilities)		-		
		ii. Operation Trash, Garbage & Cotton Rags		-		
05	Employees Occupational Health	• No Any Incident/ Accident Report during This Month.				
06	Disposal Methods	• Waste Water Effluent Discharged after Neutralization / Treatment.				
07	Land Usage	• Waste Disposal Site. (Pertain to Civil Dept.)				
08	MISCELLANEOUS FACATORS.					
	i. Spillage of Acid at Demi Plant				Nil	
	ii. Spillage of Caustic at Demi Plant				Nil	
	iii. Spillage of Acid/ Hypo at Cooling Tower				Nil	
	iv. Spillage of Oil				Nil	

Note:-

Steam turbine is under shutdown

Waste water of Power Station includes:-

- 99.9% River Water used for Turbine Condenser (Primary Cooling)
- 0.1% Water Treatment Plant and Boiler Blow down Effluent.

Environment Supervisor
747 MW CCPP, CPGCL

SOUND LEVEL (dB) OF AT 747MW, CCPP (November-2022)

387

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	64		
02	PLC Room (Chemical Section)	55		
03	Work Shop	60		
04	Hydrogen Plant	56		
05	Gas Mixing Station Left side(100m) of Turbine Hall	72		
06	Entrance Gate # 5	61		
07	Hot Water Boiler	67		
08	HSD Tank's Area (Boundary Wall)	60		
09	Gas Conditioning Skid	71	77	-
10	Turbine Hall gate b/w HRSG 1&2	87		
*11	Turbine Generator coupling	85	120	S/D
*12	Generator Exciter	84	92	S/D
*13	Turbine Compartment Compressor	80	107	-
*14	Combustion Chamber	80	105	-
15	Basement	96		
16	Condensate Pump	93		
17	Turbine Hall	85		
18	Turbine Front ST-16	87		
19	Center Control Room	56		
20	ECR	55		
21	Chemical Pump House	73		
22	Fire Fighting Pumps Room	50		
23	Main Pump House	87		
24	Plant Manager /Admin Office	46		
25	Security Post Gate # 4	57		
26	Cooling Tower Area	62		
27	Right side(100m) of Turbine Hall (Near Training Center)	60		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	57		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	63		

Note: -

- Normal limits (85 dB, Sound –meter at 7.5 meter from the source)
- *Enclosed Area

Please use Noise Protective Devices in High Noise areas.

[Signature]
 Environmental Supervisor
 747 MW CCPP, CPGCL

CHEMICAL ANALYSIS OF EFFLUENT (OUT FALL STREAM)

747 MW,CCPP, GUDDU

Date	Sample	Temp:	pH	TDS	TSS	Iron	Chloride	Chlorine	COD	Sulphate	Ammonia
-	-	°C	-	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
November -2022	Out fall	--	--	--	--	--	--	--	--	--	--

Note:-

- ◇ Steam Turbine is under shutdown
- ◇ TSS of Waste Water is directly related to the Turbidity of River Water.
- ◇ Waste water of Power Station includes:-
 - 99.9% River Water used for Turbine Condenser (Primary Cooling)
 - 0.1% Water Treatment Plant and Boiler Blow down Effluent

Environmental Supervisor
747 MW CCPP, CPGCL

388


SOUND LEVEL (dB) OF AT 747MW, CCPP (DECEMBER -2022)

389

Sr. No.	Location/Area	747 MW CCPP		
		GT	GT	ST
		14	15	16
01	Chemical Plant	64		
02	PLC Room (Chemical Section)	55		
03	Work Shop	60		
04	Hydrogen Plant	56		
05	Gas Mixing Station Left side(100m) of Turbine Hall	72		
06	Entrance Gate # 5	61		
07	Hot Water Boiler	67		
08	HSD Tank's Area (Boundary Wall)	60		
09	Gas Conditioning Skid	71	77	-
10	Turbine Hall gate b/w HRSG 1&2	87		
*11	Turbine Generator coupling	85	120	S/D
*12	Generator Exciter	84	92	S/D
*13	Turbine Compartment Compressor	80	107	-
*14	Combustion Chamber	80	105	-
15	Basement	96		
16	Condensate Pump	93		
17	Turbine Hall	85		
18	Turbine Front ST-16	82		
19	Center Control Room	56		
20	ECR	55		
21	Chemical Pump House	73		
22	Fire Fighting Pumps Room	50		
23	Main Pump House	87		
24	Plant Manager /Admin Office	46		
25	Security Post Gate # 4	57		
26	Cooling Tower Area	62		
27	Right side(100m) of Turbine Hall (Near Training Center)	60		
28	Right side(100m) of Turbine Hall (Near Scarab Yard)	57		
29	Left side(100m) of Turbine Hall (Near 500 KV Yard)	63		

Note: -* Enclosed Area

Please use Noise Protective Devices in High Noise areas.



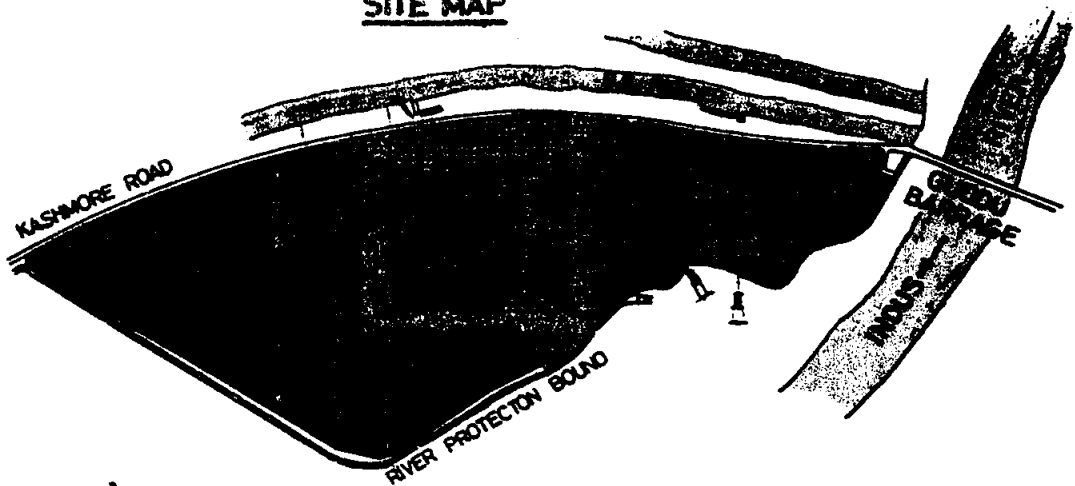
Environmental Supervisor
747 MW CCPP, CPGCL

ANNEX-R

LOCATION AND LAYOUT PLAN OF THE PLANT

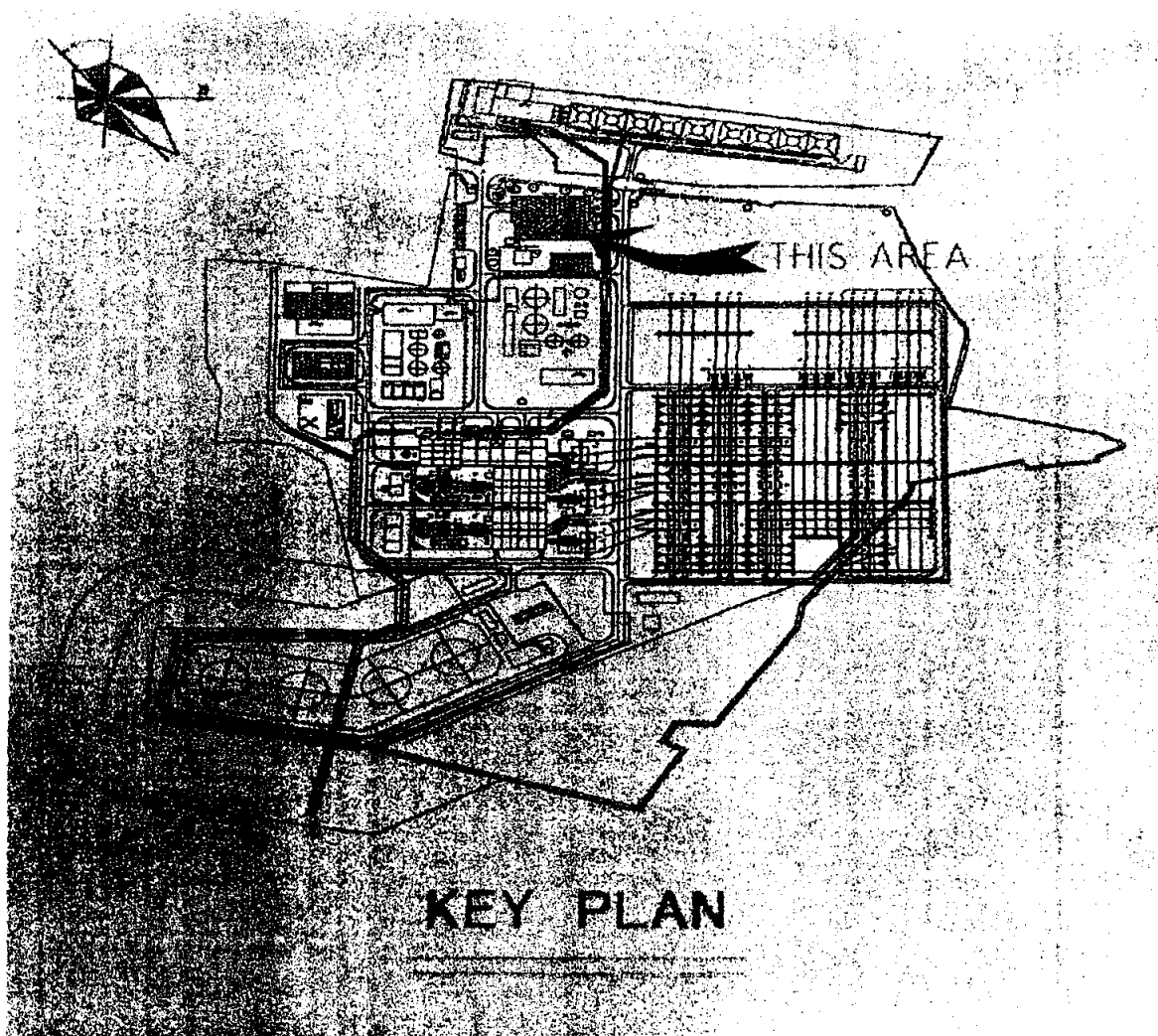
LOCATION OF THE 747 MW COMBINED CYCLE POWER PLANT GUDDU

SITE MAP



COLONY AREA	= 454 ACRES
POWER HOUSE AREA	= 250 ACRES
GROUND LEVEL AT COLONY	= 250' TO 252'
GROUND LEVEL AT POWER HOUSE	= 263'
ELEVATION OF RIVER PROTECTION BOUND	= 284'
WORST FLOOD LEVEL IN 1976 - 77 U/S	= 259.3'
WORST FLOOD LEVEL IN 1976 - 77 D/S	= 258.4'
BARRAGE ROAD LEVEL	= 271.16'

PLANT LAYOUT OF 747 MW COMBINED CYCLE POWER PLANT GUDDU



ANNEX-S

TECHNOLOGY, SIZE OF THE PLANT, NUMBER OF UNITS

PLANT CONFIGURATION

1	Plant Size (Installed Capacity (Gross) at Mean Site Conditions)	747 MW	
2	Type of Technology	Combined Cycle Power Plant	
3	Number of Units / Size (MW)	Gas Turbines	2 x 243 (MSC)
		Steam Turbine	1 x 261 (MSC)
4	Unit Make and Technology	Gas Turbines	GE (USA) PG9351 (MS 9001 FA)
		Steam Turbine	Harbin Turbine Company China
5	Commissioning / COD	17 th December 2014	
6	Expected Life (form COD)	30 years (appx.)	

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ANNEX-T

**FUEL TYPE, IMPORTED/INDIGENOUS, SUPPLIER, LOGISTICS,
PIPELINES ETC**

FUEL DETAILS

1	Primary Fuel	Natural Gas (NG)	
2	Alternate / Backup Fuel	High-Speed Diesel Oil (HSDO)	
3	Fuel Sources	Indigenous	
4	Fuel Supplier	Primary Fuel	Alternate / Backup Fuel
		Pakistan Petroleum Limited	Pakistan State Oil
5	Supply Arrangement	Primary Fuel	Alternate / Backup Fuel
		Dedicated Pipeline	Oil Tankers
6	No. of Storage Tanks of Primary/Alternate Fuel	Primary Fuel	Alternate / Backup Fuel
		N/A	04 Tanks
7	Storage Capacity of Each Tank	Primary Fuel	Alternate / Backup Fuel
		N/A	17,715m ³
8	Storage Capacity of Each Tank	Primary Fuel	Alternate / Backup Fuel
		N/A	79,869m ³

ANNEX-U

EMMISSION VALUES

EMISSION VALUES

1	SO _x	Primary Fuel	Alternate / Backup Fuel
		275 PPM	N/A
2	NO _x	Primary Fuel	Alternate / Backup Fuel
		15 ppmvd	42 ppmvd
3	CO	Primary Fuel	Alternate / Backup Fuel
		25 ppmvd	20 ppmvd
4	PM ₁₀	Primary Fuel	Alternate / Backup Fuel
		50mg/nm ³	N/A

ANNEX-V

**COOLING WATER SOURCE: TUBE WELLS, SEA/RIVER/CANAL,
DISTANCE FROM SOURCE ETC,**

400

Primary Source (Open Cycle) :

Canal Water is supplied from Begari Sind (B.S) Feeder emanating from Right Bank of River Indus at Guddu Barrage.

Secondary Source (Closed Cycle) :

During the closure of B.S Feeder, water supply is taken from Tube Wells and Floating Pump House from Guddu Barrage.

Requirement of Water:

747 MW Combined cycle 350 Cusecs

ANNEX-W

**CAPACITY, TYPE OF TECHNOLOGY, INTERCONNECTION
ARRANGEMENTS, TECHNICAL LIMITS, TECHNICAL/FUNCTIONAL
SPECIFICATIONS, AND OTHER DETAILS OF THE PLANT**

A. Plant Configuration

1	Plant Size (Installed Capacity (Gross) at Mean Site Conditions)	776.70 MW	
2	Type of Technology	Combined Cycle Power Plant	
3	Number of Units / Size (MW)	Gas Turbines	2 x 255.60 (ISO)
		Steam Turbine	1 x 265.50 (ISO)
4	Unit Make and Model	Gas Turbines	GE (USA) PG9351 (MS 9001 FA)
		Steam Turbine	Harbin Turbine Company China
5	Commissioning / COD	17 th December 2014	
6	Expected Life (form COD)	30 years (appx.)	

B. Fuel Details

1	Primary Fuel	Natural Gas (NG)	
2	Alternate / Backup Fuel	High-Speed Diesel Oil (HSDO)	
3	Fuel Sources	Indigenous	
4	Fuel Supplier	Primary Fuel	Alternate / Backup Fuel
		Pakistan Petroleum Limited	Pakistan State Oil
5	Supply Arrangement	Primary Fuel	Alternate / Backup Fuel
		Dedicated Pipeline	Oil Tankers
6	No. of Storage Tanks of Primary/Alternate Fuel	Primary Fuel	Alternate / Backup Fuel
		N/A	04 Tanks
7	Storage Capacity of Each Tank	Primary Fuel	Alternate / Backup Fuel
		N/A	17,715m ³
8	Storage Capacity of Each Tank	Primary Fuel	Alternate / Backup Fuel
		N/A	79,869m ³

C. Emission Values

1	SO _x	Primary Fuel	Alternate / Backup Fuel
		275 PPM	N/A
2	NO _x	Primary Fuel	Alternate / Backup Fuel
		15 ppmvd	42 ppmvd
3	CO	Primary Fuel	Alternate / Backup Fuel
		25 ppmvd	20 ppmvd
4	PM ₁₀	Primary Fuel	Alternate / Backup Fuel
		50mg/nm ³	N/A

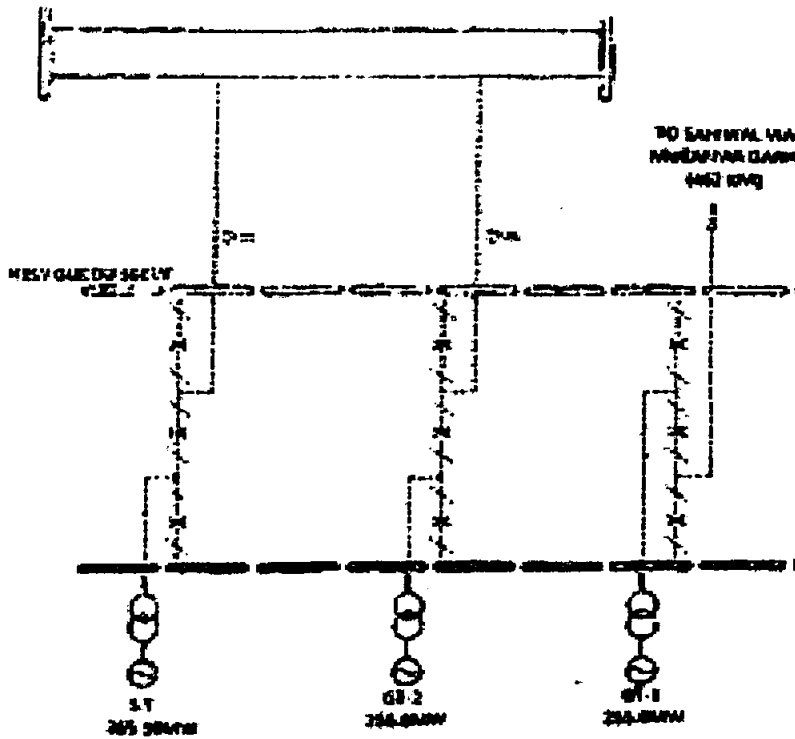
D. Cooling System

1	Cooling Water Source / Cycle	Raw water / Canal water / open-cycle and closed cycle.
---	------------------------------	--

E. Plant Characteristics

1	Generation Voltage	2 x Gas Turbines	1 x Steam Turbine
		15kV	20kV
2	Frequency	50Hz	
3	Power Factor	0.85	
4	Automation Generation Control	Yes	
5	Gas Turbine Efficiency (LHV)	36.50	
6	Combined Cycle Efficiency (LHV)	54.48	
7	Auxiliary Consumption on Gas (MW)	26.215	
8	Ramping Rate (MW/min)	2 x Gas Turbines	1 x Steam Turbine
		17.357	1.891
9	Time required to synchronize to Grid and loading the Plant to full Load (hrs.)	2 x Gas Turbines	1 x Steam Turbine
		0.26	1.5

**SINGLE LINE DIAGRAM (ELECTRICAL) OF 747 MW COMBINED CYCLE
POWER PLANT GUDDU**



**Single Line Diagram (Electrical) of New 747.00 MW CCPP
of CPGCL (GENCO-I)**

MDDO Planning Program	
NO.	70
NAME	TRANSMISSION SYSTEM FOR
DESCRIPTION	DISPATCH OF POWER FROM
DATE	NEW 747 MW CCPP UNIT
BY	AT GUDDU
REVISION	

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**INTERCONNECTION / TRANSMISSION FACILITIES FOR DISPERSAL OF
POWER FROM 747 MW COMBINED CYCLE POWER PLANT GUDDU**

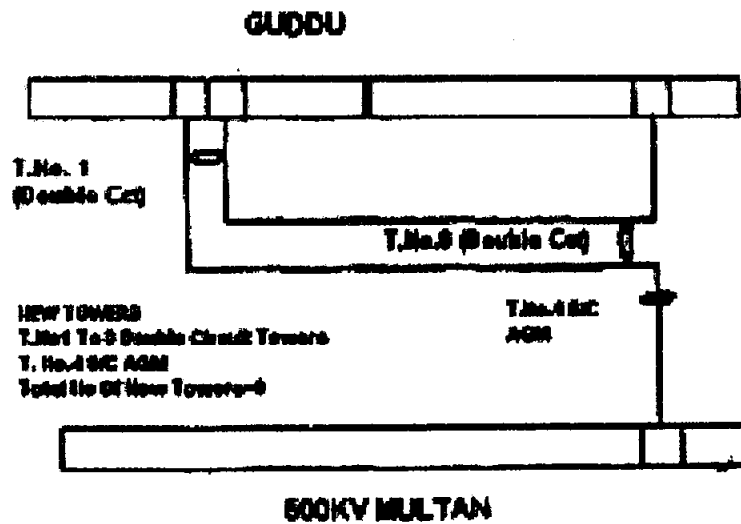
The Electrical Power from 747 MW CCPP Guddu is being dispersed through 500kV Sub-Station and Transmission Line link with the following scope:

- (i) A 500 kV Sub-Station has been constructed at 747 MW CCPP Guddu.
- (ii) A 500 kV D/C Transmission Line measuring about 2.5 km, from 500 kV Sub-Station of 747MW CCPP Guddu to 500 kV existing transmission line Guddu-Multan Circuit-III has been constructed by making an In-Out arrangement.

**SCHEMATIC DIAGRAM INTERCONNECTION / TRANSMISSION FACILITIES
FOR DISPERSAL OF POWER FROM 747 MW COMBINED CYCLE POWER
PLANT GUDDU**

**Schematic diagram of Interconnection/Transmission
Facilities for Dispersal of Power from 747 MW
CCPP of CPGCL/GENCO-II in TPS Guddu**

**SINGLE LINE DIAGRAM SHOWING THE ARRANGEMENT FOR
LOOPING IN & OUT OF 600kv SAC TL GUDDU-MULTAN(SRO)**



ANNEX X

**INSTALLED CAPACITY, DE-RATED CAPACITY AT MEAN SITE CONDITIONS,
AUXILIARY CONSUMPTION, AND THE NET CAPACITY AT MEAN SITE
CONDITIONS OF THE PLANT**

**DETAILS OF INSTALLED CAPACITY OF THE 747 MW COMBINED CYCLE
POWER PLANT GUDDU**

All figures are in Megawatts.

Description	ISO		On Gas Fuel	
	ISO	Mean Site Condition		Site Condition
2 x Gas Turbines	2 x 255.60 = 511.20	2 x 243 = 486	2 x 243.1 = 486.2	2 x Gas Turbines
1 x Steam Turbine	265.50	261	235.335	1 x Steam Turbine
Gross Capacity of the Plant	776.70	747.005	721.535	Gross Capacity of the Plant
Net output of Complete CCPP	-	720.790	694.245	Net output of Complete CCPP
Auxiliary Consumption	-	26.215	27.290	Auxiliary Consumption

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ANNEX-Y

PAST AND FUTURE REHABILITATION PLANS AND PROGRAMMES

CENTRAL POWER GENERATION CO. LTD. GENCO-II, TPS, GUDDU
GENCO'S OUTAGE SCHEDULE FOR THE YEAR 2019

Unit	From	To	Days	Maintenance Activity
GT-14	01.01.2019	07.01.2019	7	Replacement of air inlet filters+off line water washing
	01.04.2019	05.04.2019	5	Offline Water Washing +HRSG-I/Boiler Inspection
	01.08.2019	05.08.2019	5	Offline Water Washing
	01.12.2019	05.12.2019	5	Offline Water Washing
GT-15	01.03.2019	07.03.2019	7	Replacement of air inlet filters+off line water washing
	06.04.2019	10.04.2019	4	HRSG-II Boiler Inspection
	01.07.2019	05.07.2019	5	Offline Water Washing
	01.11.2019	05.07.2019	5	Offline Water Washing
ST-16	01.07.2019	07.07.2019	7	Condenser Cleaning & HRSG-I,II Boiler Inspection.

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CENTRAL POWER GENERATION CO. LTD. GENCO-II, TPS, GUDDU
GENCO'S OUTAGE SCHEDULE FOR THE YEAR 2020

Unit	From	To	Days	Maintenance Activity
GT-14	01.02.2020	10.02.2020	10	Off line washing.
GT-15				Off line washing+Bearing # 2 oil seals replacement.
ST-16				Shut down due to both GT outage.
GT-14	11.05.2020	20.05.2020	10	Off line washing.
GT-15				Off line washing.
ST-16				Condenser cleaning.
GT-14	08.08.2020	15.08.2020	08	Off line washing.
GT-15				Off line washing+Inlet Air Filter replacement.
ST-16				Boiler Inspection & valve maintenance of both HRSGs.
GT-14	01.11.2020	08.11.2020	08	Off line washing+Air Inlet Filter replacement.
GT-15				Off line washing.
ST-16				Cooling Tower Annual maintenance.

CENTRAL POWER GENERATION CO. LTD. GENCO-II, TPS GUDDU
GENCO'S OUTAGE SCHEDULE FOR THE YEAR 2021

Unit	From	To	Days	Maintenance Activity
GT-15	15.01.2021	31.01.2021	17	Offline Compressor Water Washing & HGPI Inspection.
GT-14	16.02.2021	20.02.2021	05	Offline Compressor Water Washing & HRSG-I Inspection.
GT-14	01.05.2021	20.05.2021	20	Offline Compressor Water Washing & HRSG-I Inspection & repair.
GT-15	01.05.2021	10.05.2021	10	Offline Compressor Water Washing & HRSG-II Inspection.
ST-16	01.05.2021	10.05.2021	10	Condenser cleaning & Inspection of allied equipment.
GT-14	01.08.2021	05.08.2021	05	Offline Compressor Water Washing.
GT-15	19.08.2021	23.08.2021	05	Offline Compressor Water Washing & HRSG-II Inspection.
GT-14	01.11.2021	12.11.2021	12	Offline Compressor Water Washing Filter Replacement & HRSG-I Inspection.
GT-15				Offline Compressor Water Washing Filter Replacement & HRSG-II Inspection.
ST-16				Condenser cleaning & Inspection of allied equipment.

CENTRAL POWER GENERATION CO. LTD. GENCO-II, TPS GUDDU
SCHEDULE MAINTENANCE PLAN FOR THE YEAR 2022

Unit	From	To	Days	Maintenance Activity
GT-15	3/1/2022	3/10/2022	10	Offline Compressor Water Washing, HRSG-II Inspection & Air inlet Filter duct Inspection.
ST-16				Condenser cleaning & Inspection of Allied Equipments.
GT-15	6/11/2022	6/20/2022	10	Offline Compressor Water Washing, HRSG-II Inspection & Air inlet Filters replacement.
ST-16				Condenser cleaning & Inspection of Allied Equipments.
GT-14	9/11/2022	9/15/2022	05	Offline Compressor Water Washing & HRSG-I Inspection.
GT-15	9/21/2022	9/25/2022	05	Offline Compressor Water Washing & HRSG-II Inspection.
GT-14	12/11/2022	12/30/2022	20	Offline Compressor Water Washing, HRSG-I Inspection & Air inlet Filters replacement.
GT-15				Offline Compressor Water Washing & HRSG-II Inspection.
ST-16				Condenser cleaning & Inspection of Allied Equipments.

CENTRAL POWER GENERATION CO. LTD. GENCO-II, TPS GUDDU
SCHEDULE MAINTENANCE PLAN FOR THE YEAR 2023

Unit	From	To	Days	Maintenance Activity
GT-14	3/6/2023	3/10/2023	05	Offline Compressor water washing, Air inlet filters duct & IGV inspection and other shutdown jobs.
GT-15	3/16/2023	4/20/2023	36	Major Inspection / Overhauling as per CSA, Air inlet filters replacement & other auxiliaries inspection & maintenace.
GT-14	6/20/2023	6/24/2023	05	Offline Compressor water washing, Air inlet filters duct & IGV inspection and other shutdown jobs.
GT-15	7/26/2023	7/30/2023	05	Offline Compressor water washing, Air inlet filters duct & IGV inspection and other shutdown jobs (if any).
GT-14	9/21/2023	9/30/2023	10	Offline Compressor water washing, Air inlet filters replacement, Duct & IGV inspection and other shutdown jobs.
GT-15	11/6/2023	11/10/2023	05	Offline Compressor water washing, Air inlet filters duct & IGV inspection and other shutdown jobs (if any).
GT-14	12/26/2023	12/30/2023	05	Offline Compressor water washing, Duct & IGV inspection and other shutdown jobs.
ST-16	10/1/2023	12/29/2023	90	Damages Assesment & Rehabilitation / Major Overhauling of all BOPs and other jobs.



Rotor & Compressor Stator blades replacement

**New Rotor, Compressor Stator blades &
HGP Parts replacement**

GUDDU

Outage Start Date: 07 May 2022

ESN/SY: 299041 | SY0364361

Oracle Project ID: A-1705904 | EV-126207

Report Issued: 21 Jul 2022

Prepared By

Zafar Iqbal

Field Engineer (TFA)

Approved By

Muhammad Asim

Field Engineer (TFA)

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GE Power Power Services

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OUTAGE DETAILS

1 Summary

1.1 Site Personnel

Name	Category	Role
Rizwan Asim	GE	CPM
Zafar Iqbal	FieldCore	Lead TFA
Asad Rehman	FieldCore	TFA
Sikander Ali	FieldCore	TFA
Mostafa Ramdan	FieldCore	TFA
Harris Malik	FieldCore	Control TFA
Muhammad Jillani	FieldCore	EHS
Saeed Akbar	FieldCore	EHS
Muhammad Ahmad	FieldCore	Bucket Tech

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1.2 Executive Summary

Guddu 747 MW is a combined cycle Power Plant with a configuration of 2 X Frame 9FA.02 GE Gas Turbines and 1 Steam Turbine with a total complex output of 747 MW. Unplanned outage of unit was successfully carried out Guddu site (Unit # GT1 - TSN: 299041) re-assembly started on May 07, 2022.

Parts replaced:

- Installation of New Rotor
- Installation of New Journal Bearings 1 & 2
- Installation of New Thrust Bearing Active and Inactive
- Installation of New Bearings Labyrinth Seals 1 & 2
- Installation of New Stator Blades lower and upper half
- Installation of New IGV Vanes, Gears and Bushes
- Installation of New Honey Comb Seal of Inner Barrel upper and lower half
- Installation of New Load Coupling Bolts Turbine and Generator End
- Installation of New 1st and 2nd Stage Nozzle
- Installation of New 1st Stage Bucket
- Installation of New One 3rd Stage Nozzle Segment # 7
- Installation of all New Hardware for HGP Components
- Installation of all Refurbished Transition Pieces.
- Installation of all Refurbished Combustion Liners
- Installation of all Refurbished Fuel Nozzle Quat Cap
- Installation of all Refurbished Fuel Nozzles
- Installation of all New X-Fire Tubes Female and Male
- Installation of all New Retainers, New Gasket of Cooling and Sealing Air Piping

The detailed findings are briefed in relevant sections of report.

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GAS TURBINE (299041 | SY0364361)

1 Summary

1.1 Timers and Counters

Technology	Gas Turbine
Fired Starts	381
Total Starts	475
Emergency Stops	231
Operating Hours	42807
Total Fired Hours	42807
Date Of The Last Inspection	27 Apr 2018

1.2 Work Scope

Turbine
Rotor Replacement, Stator Vanes Replacement, HGPI Components Inspection based replacement

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GE Power Power Services

2 Technical

2.1 Recommendations

Continuous Dynamics Monitoring

Immediate

Parts

Site doesn't have any spare amplifiers & BAPA cards spares should be ordered for contingency.

Stage 2 Buckets

Next Outage

Parts

Plan replacement of 2nd Stage Buckets in next opportunity.

Stage 3 Buckets

Next Outage

Parts

Required replacement of 3rd Stage Buckets in next opportunity or do BI inspection when it is possible.

Combustible Gas Detectors

Next Outage

Parts

This catalytic type sensing system is not reliable and has become obsolete, its highly recommended to upgrade to an aspirated detection system to ensure reliability of the safety critical devices.

Fuel Gas Purge Valves

Next Outage

Parts

Site should order the equivalent Purge valve for VA13-2 and spare DVC.

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3 Turbine

3.1 Inlet Section

3.1.1 Inlet Bellmouth

Part Description:

Disassembly

Inlet bell mouth was disassembled and removed. All the axial dowels were removed followed by removal of vertical joint bolts. After the vertical joint all the horizontal joint bolts were removed and secured. Inlet bell mouth casing upper half was removed and lifted with crane and secured in laydown area. Critical lift plan was made and followed during the lift. Removed all Old IGVs from UH and LH including Gears and Bushes for replacement with new IGVs Set and Hardware.

Clean and Inspect

IGVs and its components were examined for various inspection points, the details of which are mentioned below.

- Erosion Marks- Light
- Deposits- Medium
- Thinning of Trailing and leading edges- Light
- Cracks in Vane- Medium
- Corrosion pitting- Light
- Oil marks and deposits- Light

During inspection of Inlet Bellmouth Casing, paint was found chipped off and corrosion on different location of upper and lower half of Bellmouth Casing. Engineering case was opened and recommendation was to remove any damaged or loose paint and feather into areas of good, sound paint this time and push the paint repair to next possible window. Per unit records, the ML0812 is identified as 136E5549G011, in which the painting specs are P6C-AG31 Primer Coat, P6C-AG35 EPOXY top Coat, and P4A-AL-1801 Surface Prep, for the bellmouth painting.

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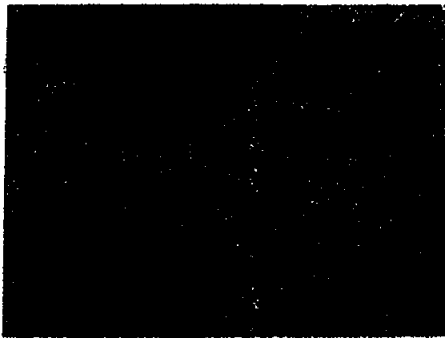
GE Power Power Services

3.1.1 Inlet Bellmouth

As per recommendation, cleaning and buffing of corrosion area of Bellmouth casing was carried out on both upper and lower half including Air Inlet Plenum side walls. Customer supplied paint was applied on different areas where paint chipped off.

Assembly

Inlet bell mouth casing was lifted and installed following the lift plan. All bolts and dowels were installed and torqued as per specification. After completing the bell mouth installation IGV arm was connected with the VIGV ring and mechanical locks securing the IGV pinions were removed returning the IGV to service.



IGV Casing Rigging



IGV Casing



IGV Casing



New IGV Installed

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Imagination at Work

LARGE CALL-OUT - 299041

CENTRAL POWER GENERATION COMPANY LTD

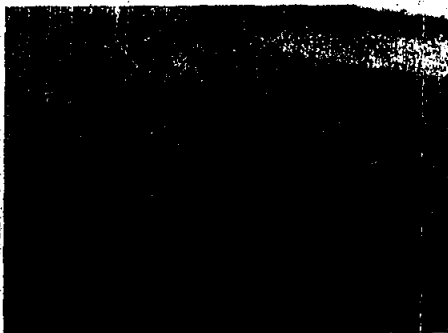
GUDDU

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GE Power Power Services

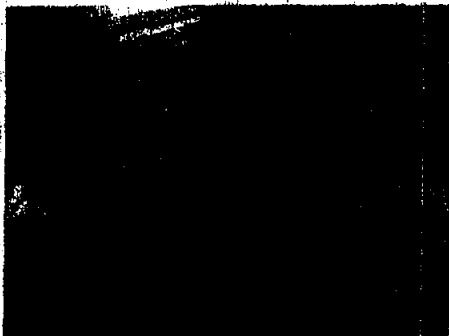
3.1.1 Inlet Bellmouth



Casing Paint Damages



Casing Paint Damages



Casing Paint Damages



Casing Paint Damages

3.1.2 Inlet Guides Vanes

Part Condition: Fair

Part Description:

Disassembly:

All the Inlet Guide Vanes were cleaned, visually inspected for any physical observation and found mostly vanes were damage due to foreign material pass through in machine. All old Vanes, inner & outer bushes and gears were removed.

Assembly:

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GE Power Power Services

3.1.2 Inlet Guides Vanes

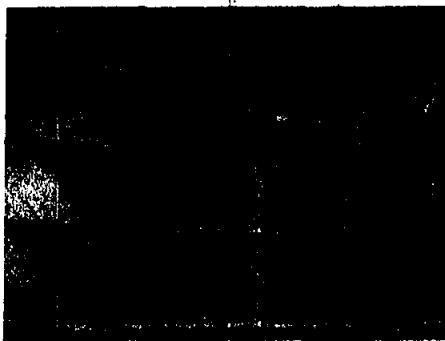
Installed new IGV Vanes, Inner & outer bushes and Gears. Made adjustment of IGV angles as per GE specification and returned to service after assembly of upper half inlet bell mouth, X1, X2, Inner Bushing clearance, Gear Backlash and Angle were checked for all vanes as well as per TIL 517-CR, TIL 1068-R3. All the measurements were found within allowable specs.



IGVs & Casing



New IGVs



PWOW1420



Old IGVs

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GT4021 IGV Final Assembly clearances

g INSPECTION REPORT
Gas Turbine Maintenance

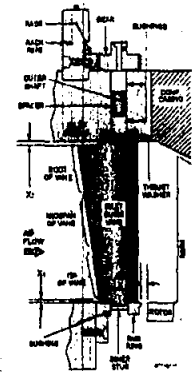
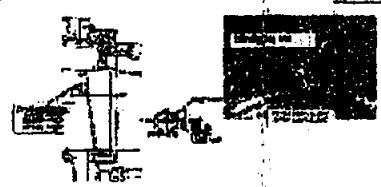
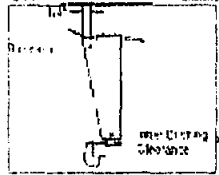
Compressor

Inlet Guide Vane Angle Setting and Measurements

All B-, E-, and F-class gas turbine except 4F.01, 7F.04-200, 7F.06, and 9F.05-PL.18, Aviom Test

Date: 19/04/2022 Turbine No. 26004
P.S.R.# Sketches Enclosed?

Prepared by: Muhammad Rezaq
Photos Enclosed? Yes



ITEM UNIT	MEASUREMENT	REFERENCE
		Clearance DWS (4021) - TL, applicable to Unit
		Clearance DWS (4021) - TL, applicable to Unit
		MSI 0511
		INLET BUSHING CLEARANCE (Applicable TL)

As Found Check
As Lab Check

Item No.	As Found	As Lab	Reference
1	0.028	0.050	0.018 0.001 98.0
2	0.024	0.050	0.014 0.001 98.0
3	0.028	0.050	0.014 0.001 98.0
4	0.023	0.050	0.015 0.001 98.0
5	0.030	0.050	0.015 0.001 98.0
6	0.030	0.053	0.018 0.001 98.0
7	0.030	0.054	0.018 0.002 98.0
8	0.030	0.052	0.018 0.001 98.0
9	0.030	0.054	0.014 0.001 98.0
10	0.028	0.054	0.018 0.001 98.0
11	0.028	0.054	0.020 0.001 98.0
12	0.028	0.058	0.018 0.001 98.0
13	0.028	0.056	0.018 0.001 98.0
14	0.023	0.056	0.018 0.002 98.0
15	0.018	0.056	0.018 0.001 98.0
16	0.030	0.053	0.013 0.001 98.0
17	0.030	0.056	0.009 0.002 98.0
18	0.033	0.058	0.007 0.001 98.0
19	0.030	0.059	0.008 0.001 98.0
20	0.024	0.058	0.013 0.001 98.0
21	0.030	0.068	0.011 0.002 98.0
22	0.025	0.060	0.010 0.001 98.0
23	0.022	0.060	0.012 0.001 98.0
24	0.022	0.051	0.018 0.001 98.0
25	0.030	0.051	0.018 0.001 98.0
26	0.030	0.052	0.018 0.001 98.0
27	0.032	0.051	0.018 0.001 98.0
28	0.032	0.052	0.014 0.001 98.0
29	0.030	0.052	0.014 0.002 98.0
30	0.028	0.051	0.016 0.001 98.0

Item No.	As Found	As Lab	Reference
31	0.023	0.052	0.018 0.001 98.0
32	0.022	0.052	0.023 0.001 98.0
33	0.024	0.052	0.024 0.001 98.0
34	0.024	0.052	0.024 0.001 98.0
35	0.014	0.052	0.028 0.001 98.0
36	0.030	0.053	0.018 0.001 98.0
37	0.030	0.058	0.028 0.002 98.0
38	0.030	0.058	0.025 0.001 98.0
39	0.014	0.021	0.017 0.001 98.0
40	0.030	0.054	0.018 0.001 98.0
41	0.022	0.053	0.013 0.001 98.0
42	0.028	0.050	0.028 0.002 98.0
43	0.031	0.051	0.018 0.001 98.0
44	0.020	0.044	0.008 0.001 98.0
45	0.023	0.050	0.013 0.001 98.0
46	0.024	0.052	0.009 0.001 98.0
47	0.018	0.050	0.008 0.001 98.0
48	0.030	0.050	0.010 0.001 98.0
49	0.022	0.050	0.009 0.001 98.0
50	0.022	0.050	0.008 0.001 98.0
51	0.020	0.050	0.008 0.001 98.0
52	0.020	0.053	0.008 0.001 98.0
53	0.020	0.053	0.010 0.001 98.0
54	0.022	0.052	0.008 0.001 98.0
55	0.023	0.050	0.013 0.001 98.0
56	0.023	0.054	0.010 0.001 98.0
57	0.030	0.054	0.010 0.001 98.0
58	0.024	0.054	0.011 0.001 98.0
59	0.024	0.054	0.018 0.001 98.0
60	0.022	0.054	0.018 0.001 98.0

Comments: [Blank]

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GE Power Power Services

3.2 Compressor Section

3.2.1 Compressor Discharge Casing

Part Condition: Good

Part Description:

Disassembly

Compressor Discharge Casing was disassembled and removed. All the Horizontal and Vertical bolting was removed. Compressor Discharge Casing was lifted following a critical lift plan and secured the Casing in laydown area in a vertical position for the inspection and cleaning of Stator Vanes.

Clean and Inspect

Compressor Discharge Casing was examined for various inspection points, the details of which are mentioned below.

- Cracks - None
- Wear - Light
- Galling - None
- Edge Damage - None
- Leakage marks at flange interface - None

Assembly

Before placing the upper half CDC Borescope inspection was performed for lower half to check for any foreign material. Once the BI was complete CDC upper half was installed and all the Horizontal & Vertical joints dowels & bolts were tightened as per the torque specs. All as found clearances were recorded as per procedure. During assembly, the closing clearances were recorded and submitted to engineering. After getting engineering disposition unit was proceeded with remaining assembly.

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LARGE CALL-OUT - 259041

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GE Power Power Services

3.2.1 Compressor Discharge Casing



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GT4036 Compressor Rotor Final clea...



INSPECTION REPORT
Gas Turbine Maintenance

MS9001FA+e

Compressor

Rotor Clearances

Date 09/06/2022
FSR # _____

Turbine S/N 299041
Sketches Enclosed? No
Date Type Opening & Closing

Prepared By Zafar Iqbal
Photos Enclosed? No



POSITION 1 WITH #1
BOLT HOLE OF COMP. ROTOR AT LEFT

NOTE:

1. All radial clearances are measured with rotor against the radial thrust face. Refer to drawing for confirmation of rotor position.
2. Refer to clearance diagram for specified dimensions.
3. Take readings with rotor positioned as follows:
 - a. Position 1L with #1 bolt hole of comp. rotor at left horizontal joint.
 - b. Position 1R with #1 bolt hole of comp. rotor at right horizontal joint.

REFER TO DIAGRAM ON SHEET (b).

REFERENCE ROTOR CLEARANCE DRAWING NO. _____

COMPRESSOR ROTOR S/N

	0.099	0.095	0.090	0.113
	0.121	0.127	0.108	0.126
	0.096	0.111	0.077	0.092
	0.104	0.118	0.101	0.110
	0.085	0.082	0.080	0.094
	0.082	0.091	0.070	0.080
	0.083	0.103	0.071	0.084
	0.081	0.097	0.078	0.082
	0.079	0.090	0.075	0.082
	0.088	0.084	0.070	0.068
	0.077	0.090	0.070	0.076
	0.083	0.099	0.071	0.072
	0.073	0.085	0.073	0.072
	0.083	0.092	0.080	0.078
	0.078	0.081	0.083	0.074
	0.089	0.088	0.086	0.076
	0.084	0.083	0.081	0.068
	0.091	0.090	0.092	0.078
	0.089	0.079	0.085	0.078
	0.089	0.084	0.086	0.082

	0.078	0.081	0.085	0.088
	0.081	0.088	0.088	0.078
	0.078	0.083	0.094	0.082
	0.087	0.087	0.093	0.088
	0.079	0.083	0.088	0.081
	0.073	0.085	0.092	0.078
	0.078	0.081	0.090	0.080
	0.092	0.094	0.098	0.098
	0.098	0.102	0.112	0.106
	0.103	0.104	0.100	0.103
	0.094	0.108	0.110	0.107
	0.098	0.101	0.098	0.074
	0.106	0.106	0.120	0.114
	0.094	0.109	0.113	0.110
	0.101	0.107	0.120	0.114
	0.054	0.033	0.040	0.038
	0.037	0.039	0.040	0.040
	0.036	0.037	0.040	0.040

	0.315	0.319	0.301	0.305
	0.036	0.037	0.044	0.042
	0.159	0.149	0.161	0.162

Comments: _____

435

GT4036 Compressor Rotor Final clea...

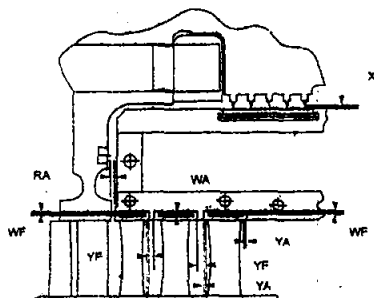
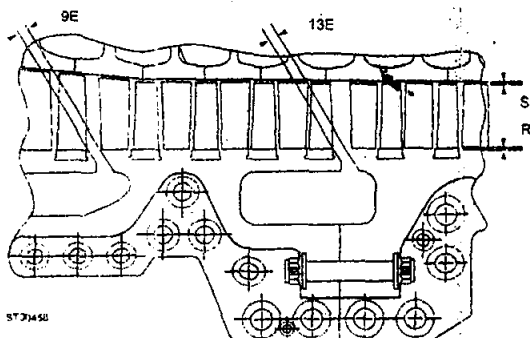
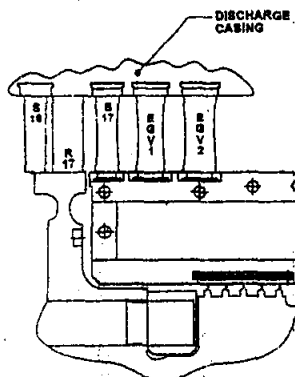
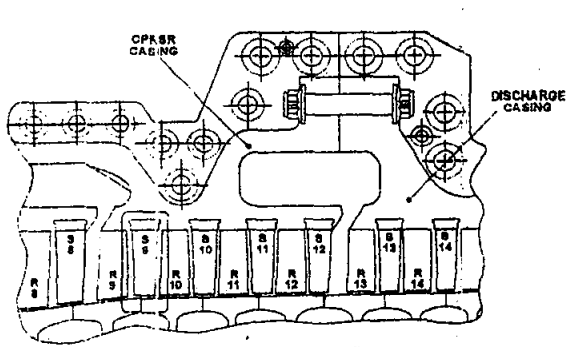
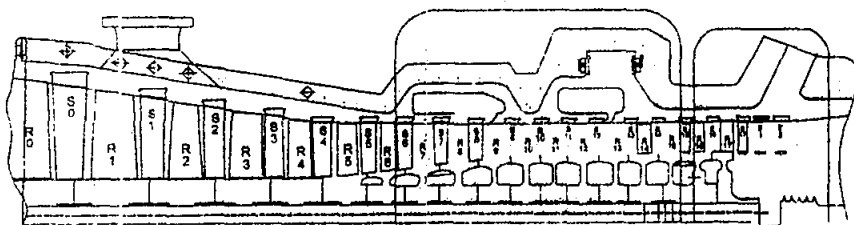
g

INSPECTION REPORT
Gas Turbine Maintenance

Compressor
Rotor Clearances

MS9001FA+e

Date 09/06/2022 Turbine S/N _____ Prepared By _____
FSR # _____ Sketches Enclosed? _____ Photos Enclosed? _____
Data Type _____



9136

GE Power Power Services

3.2.2 Inner Barrel

Part Condition: Good

Part Description:

Disassembly

Inner Barrel was disassembled and upper half removed as a part of standard MI scope. Removed Old Honeycomb Seal from lower and upper half. Cleaned Seal groove properly for smoothly installation of new Honeycomb Seal.

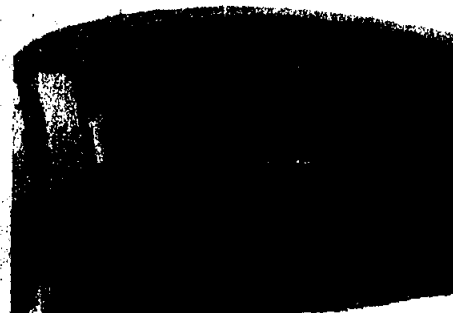
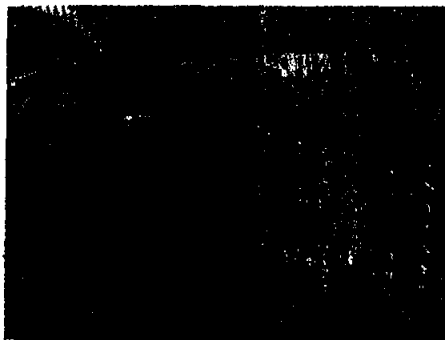
Clean and Inspect

Inner Barrel was examined for various inspection points, the details of which are mentioned below.

- Wear (None)
- Honeycomb seal condition (Slight wear on the honeycomb impressions)
- Cracks (None)
- Edge Damage (None)

Assembly

Honeycomb Seal was replaced with a new one upper and lower half. After installation of Rotor upper half Inner Barrel installed. Cap screws and counter bore plugs were installed and torqued as per the specs.



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Imagination at Work

LARGE CALL-OUT - 299041
CENTRAL POWER GENERATION COMPANY LTD
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GE Power Power Services

3.2.3 Compressor Casing

Part Condition: Good

Part Description:

Disassembly

Compressor Casings upper half were disassembled and removed. All the Horizontal and Vertical bolting was removed. Compressor Casing was lifted following a critical lift plan and secured the Casing in laydown area in a vertical position for the inspection and cleaning of Stator Vanes.

Clean and Inspect

Compressor Casings were examined for various inspection points, the details of which are mentioned below.

- Cracks - None
- Wear - None
- Galling - None
- Edge Damage - None
- Leakage marks at flange interface - None

Assembly

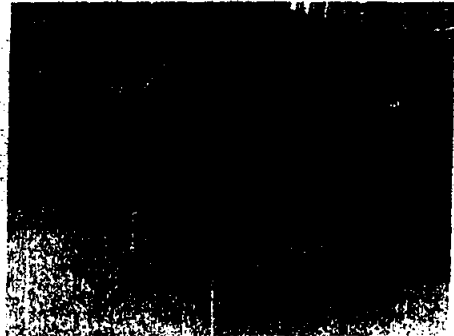
Before placing the upper half Casing Borescope inspection was performed for lower half to check for any foreign material. Once the BI was complete Compressor Casing upper half was installed. After UH Casing placement. Horizontal joint & Vertical joint dowels and bolts were torqued as per specs.



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GE Power Power Services

3.2.3 Compressor Casing



3.2.4 Stator Vanes

Part Condition: Poor

Part Description:

Cleaning and Inspection

After removing of UH Casing and Rotor, lower half Stator Vanes were inspected and cleaned in place whereas upper half Stator Vanes were inspected and cleaned in laydown area. Vanes were manual hand cleaning was performed. Mapping of damage Stator vanes was done by Bucket Tech and submitted for Engineering review.

Stator Vanes was examined for various inspection points, the details of which are mentioned below.

- Tip Bends - Heavy
- Nicks - Medium
- Dents - Heavy
- Erosion Marks - Medium
- Corrosion Marks - Light
- Edge Damage - Heavy

After receiving Engineering disposition, all Stages of Compressor Stator Vanes from lower

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 Imagination at Work

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CENTRAL POWER GENERATION COMPANY LTD
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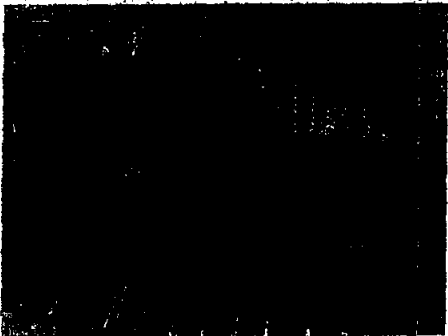
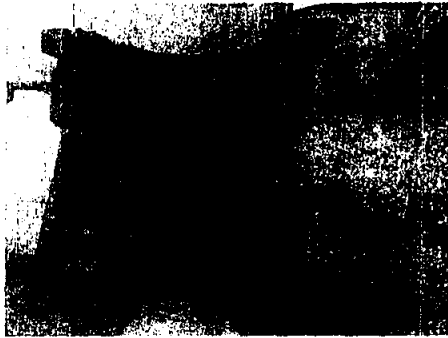
GE Power Power Services

3.2.4 Stator Vanes

and upper half removed and replaced with New Set of Stator vanes.

Assembly

Installed new set of compressor stator vanes from lower and upper half compressor casing from Stage # 0 to 17 and EGV-1 & EGV-2. Drop checked of all stages of stator vanes from lower and upper half and found some difference with GE Specification, removed 2 to 3 Segments from each Stage and send to machine shop for machining of edge to meet clearance as per GE Specification. Drop re-checked of all Stages of Stator Vanes from lower and upper half after machining and found clearances as per GE Specification.



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3.2.5 Compressor 6 Point Check

Part Condition: Good

Part Description:

Six Point checks were done before disassembly and after assembly. Six-point checks were done from Compressor and Turbine section both, all readings were recorded in the form as a reference for opening readings. When assembly was completed, final six-point checks were recorded as well. These values were checked with the unit specific six-point check readings and it was confirmed that all values are within specified limits.

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LARGE CALL-OUT - 299041

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GT1025 6 Point As found check

INSPECTION REPORT
Gas Turbine Maintenance
MS 5001, 9001F

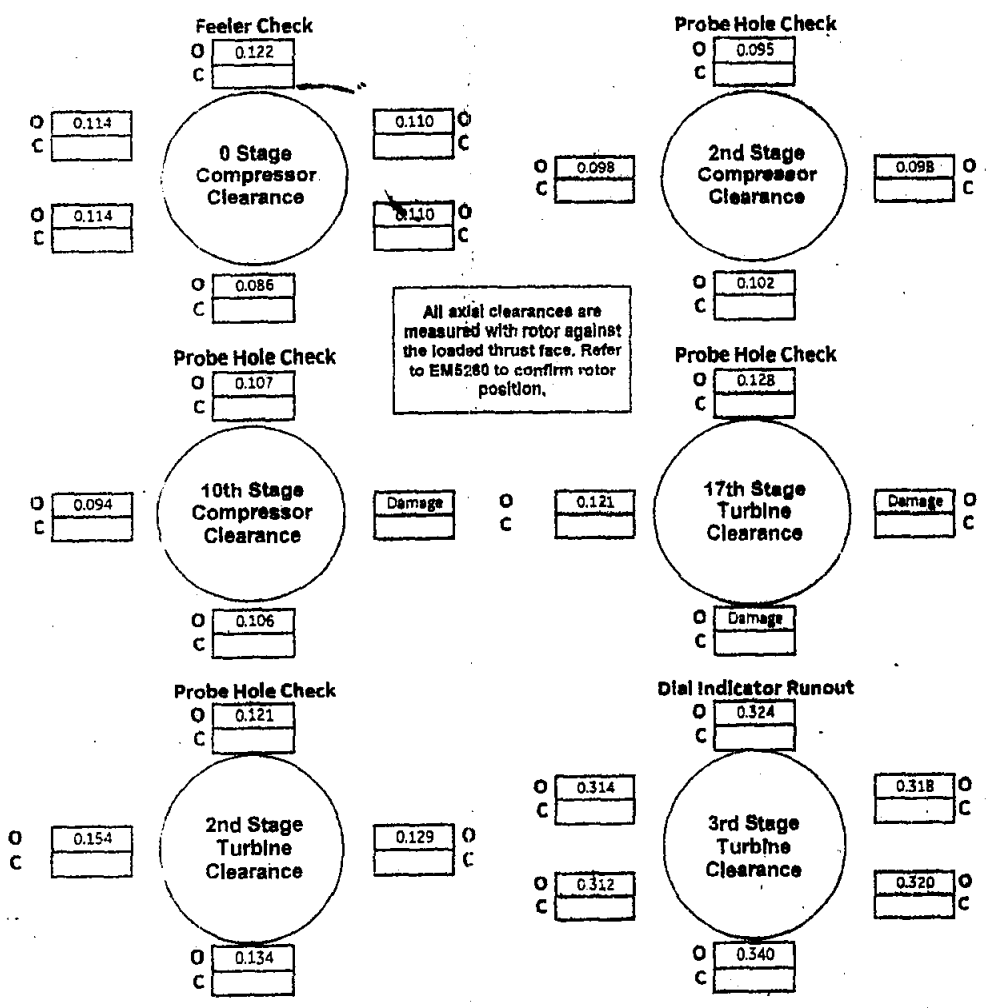
Alignment

Rotor Position

Date 13/7/2021 Turbine S/N 299041 Prepared by Zafar Iqbal
FSR # _____ Sketches Enclosed? As Found Photos Enclosed? _____

Rotor Tip Clearances are to be measured and recorded below. All views with turbine flow.

Opening Positioning Checks (Disassembly) YES
Closing Positioning Checks (Reassembly) C



Comments: _____

GT1040 6 Point Final check

(942)



INSPECTION REPORT
Gas Turbine Maintenance

Alignment
Rotor Position

Equip. Code: 9PA

ERP Proj. ID: _____

Turbine S/N: 299041

Prepared by: Zefar Iqbal

As Found Date: _____

As Left Date: 06/22/2022

Unit of Measure: inch

Enter Data on the Worksheet Tab.

Clearance Drw (as found): _____

Clearance Drw (as left): _____

Feeler Check

O
C 0.115

O
C 0.117

0 Stage
Compressor
Clearance

O
C 0.117

O
C 0.116

O
C 0.118

O
C 0.105

Probe Hole Check

O
C 0.085

O
C 0.112

5th Stage
Compressor
Clearance

O
C 0.113

O
C 0.106

Probe Hole Check

O
C 0.120

O
C 0.118

2nd Stage
Compressor
Clearance

O
C 0.119

O
C 0.115

Probe Hole Check

O
C 0.134

O
C 0.110

10th Stage
Compressor
Clearance

O
C 0.112

O
C 0.130

Probe Hole Check

O
C 0.147

O
C 0.138

17th Stage
Compressor
Clearance

O
C 0.155

O
C 0.138

O
C 0.155

O
C 0.180

Feeler Check

O
C 0.355

O
C 0.320

2nd Stage
Turbine
Clearance

O
C 0.324

O
C 0.340

O
C 0.335

3rd Stage
Turbine
Clearance

O
C 0.310

O
C 0.338

O
C 0.332

O
C 0.345

Comments:

963

GE Power Power Services

3.3 Combustion Section

3.3.1 Liner Cap

Part Condition: Poor

Part Description:

Disassembly:

All 18 Liners Cap were removed from FWD Combustion Cans as a part of standard CI (Combustion Inspection) and stored in laydown area for inspection. Respective Can # was marked on the Liner Cap and it was placed in laydown area.

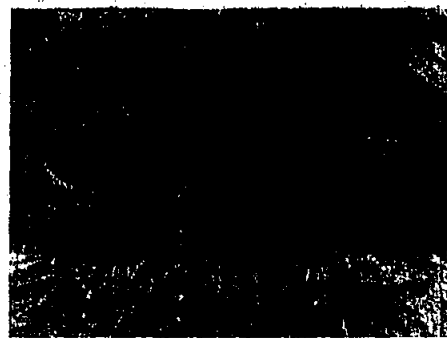
Clean and Inspect

The removed Combustions liners were examined for various inspection points, the details of which are mentioned below.

- Liner cooling holes crack - Light
- Liner stop cracks, wear or deformation - Light
- Liner Spring seals for cracks, distortion, missing leaves, bent leaves - Light
- Liner rivets cracks - None

Assembly

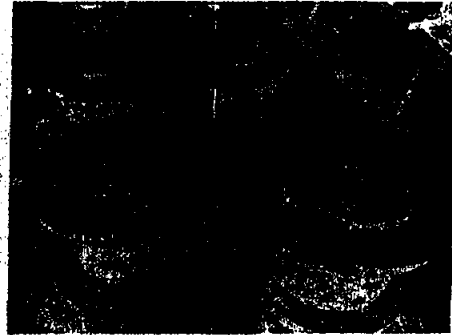
Refurbished Liners Caps were installed on FWD Combustion Casing during assembly and their part numbers are available in PIPO section. Liners Cap were rigged and installed in their respective Combustion Can location and liner stops were fully seated.



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3.3.1 Liner Cap



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LARGE CALL-OUT - 299041

CENTRAL POWER GENERATION COMPANY LTD

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445

Quat Cap

g INSPECTION REPORT
Gas Turbine Maintenance
All Frame Sizes

Combustion QUATERNARY CAP ASSY

Date: 27/05/2022 Turbine S/N: 299041 Prepared by: Zafar Iqbal
FSR #: _____

Instructions: Request the as running part information from the Support Central Site link below.
http://supportcentral.ge.com/small/sup_logacase_home.asp?prod_id=25688&case_category_id=18047

Combustion Chamber Number (Out)	Dwg Number / Part Number (Out)	Serial Number (Out)
1	109T7009G0001	17-08-001
2	109T7009G0001	17-08-003
3	109T7009G0001	17-08-004
4	109T7009G0001	17-08-005
5	109T7009G0001	17-08-008
6	109T7009G0001	17-08-007
7	109T7009G0001	17-08-008
8	109T7009G0001	17-08-009
9	109T7009G0001	17-08-010
10	109T7009G0001	17-08-011
11	109T7009G0001	17-08-012
12	109T7009G0001	17-08-013
13	109T7009G0001	17-08-014
14	109T7009G0001	17-08-015
15	109T7009G0001	17-08-016
16	109T7009G0001	17-08-017
17	109T7009G0001	17-08-018
18	109T7009G0001	17-08-019

Combustion Chamber Number (In)	Dwg Number / Part Number (In)	Serial Number (In)
1	109T7009G0001	17-08-1719
2	109T7009G0001	17-08-1721
3	109T7009G0001	17-08-1723
4	109T7009G0001	17-08-1724
5	109T7009G0001	17-08-1725
6	109T7009G0001	17-08-1726
7	109T7009G0001	17-08-1727
8	109T7009G0001	17-08-1728
9	109T7009G0001	17-08-1729
10	109T7009G0001	17-08-1730
11	109T7009G0001	17-08-1731
12	109T7009G0001	17-08-1732
13	109T7009G0001	17-08-1733
14	109T7009G0001	17-08-1734
15	109T7009G0001	17-08-1735
16	109T7009G0001	17-08-1736
17	109T7009G0001	17-09-039
18	109T7009G0001	17-09-040

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3.3.2 Flame Detectors

Part Condition: Fair

Part Description:

Disassembly:

Flame Detectors were removed from Can # 15, 16 17 & 18 as a part of standard CI (Combustion Inspection) and stored in I&C Store for inspection. Respective Can # was marked on the Flame Detector and it was placed in I&C Store.

Clean and Inspect

The removed Flame Detectors were examined for various inspection points, the details of which are mentioned below.

- Glass Sensor Inspection - Good
- Cable inspection - Good
- Body condition - Good
- Cable jack inspection - Good

Assembly

Old Flame Detectors tested before installation. Installed Flame Detectors after thoroughly inspection on Can # 15, 16, 17 & 18 during assembly replaced all Gasket with new Gasket and Torqueing bolts as per GE Specification.



Flame Detector



Flame Detector

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3.3.3 Combustion Cans

Part Condition: Good

Part Description:

Disassembly

All 18 Combustion cans were removed as a part of standard CI (Combustion Inspection). Combustion liners, inner and outer crossfire tubes and flow sleeves were removed before disassembly of combustion liners. Gasket from the gasket fit recess was removed and discarded. Can holes were covered after removing the can as FME protection.

Clean and Inspect

Combustion casing gasket fit recess was cleaned for any high points. The removed combustion Cans were examined for various inspection points, the details of which are mentioned below

- Combustion Can Hinge Cracking - None
- Freedom of hinges - None
- Loose hardware - None
- Any cracks on body - None
- Signs of overheating - None

Assembly

New gaskets were installed on combustion cans (Both Fwd. and Aft. combustion casings). The gaskets of end cover and forward casing was replaced, and casing bolts torquing performed. A 0.0015" feeler check was done to ensure that the metallic contact is even on all sides. Integrity of gasket, bolting and torquing was re-checked before starting up of the machine.

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Imagination at Work

LARGE CALL-OUT - 299041
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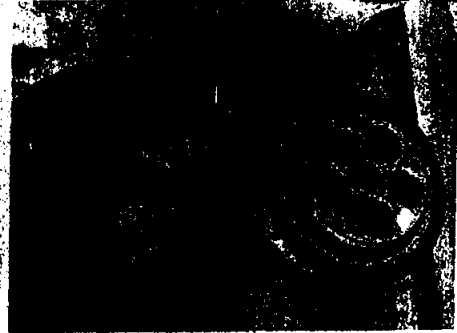
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GE Power Power Services

3.3.3 Combustion Cans



FWD Can



FWD Can with Quat Cab

3.3.4 Flow Sleeves

Part Condition: Good

Part Description:

Disassembly

All 18 Flow Sleeves were removed as a part of standard CI (Combustion Inspection). Combustion Liners and inner Crossfire Tubes were removed prior to disassembly of Flow Sleeves. Flow Sleeves were marked with respective Can # and placed in laydown area. All Can openings were covered with FME covers after removal of Flow Sleeves

Clean and Inspect

All old flow sleeves were to be Re-installed. All removed Flow sleeves were examined for various inspection points and there were no observations.

Assembly

Re-installed same old Flow Sleeves & Inspected, installed Flow Sleeves as per the marking done during disassembly started from the lower Combustion Can going up on both the sides. In addition to that Cans having Spark Plugs and Flame Scanners Holes were aligned as well. All the new Allen head bolts were installed and torqued accordingly.

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3.3.4 Flow Sleeves



BFSY6013



IMG 2846

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(450)

GT7133 Flow Sleeve PIPO



All Frame Sizes 9FA.01

Combustion

Flow Sleeve

Date: 18/07/2021
FSR #: _____

Turbine S/N: 299041

Prepared by: Zafar Iqbal

Instructions: Request the as running part information from the Support Central Site link below.
<https://myproductlife.pw.ge.com/lcpr/pages/lcprhome.html>
Parts Life Database requires access

Combustion Chamber Number (Out)	Dwg Number / Part Number (Out)	Serial Number (Out)
1	133E7629G001	H 8031
2	133E7629G001	H 8030
3	133E7629G001	H 8044
4	133E7629G001	H 8028
5	133E7629G001	H 7912
6	133E7629G001	H7556
7	133E7629G001	H 7553
8	133E7629G001	H 8038
9	133E7629G001	H 8032
10	133E7629G001	H 8040
11	133E7629G001	H 7550
12	133E7629G001	H 8036
13	133E7629G001	H 8041
14	133E7629G001	H 8027
15	133E7629G001	H 8042
16	133E7629G001	H 8036
17	133E7629G001	H 8043
18	133E7629G001	H 8037

Combustion Chamber Number (In)	Dwg Number / Part Number (In)	Serial Number (In)
1	133E7629G001	H 8031
2	133E7629G001	H 8030
3	133E7629G001	H 8044
4	133E7629G001	H 8028
5	133E7629G001	H 7912
6	133E7629G001	H7556
7	133E7629G001	H 7553
8	133E7629G001	H 8038
9	133E7629G001	H 8032
10	133E7629G001	H 8040
11	133E7629G001	H 7550
12	133E7629G001	H 8036
13	133E7629G001	H 8041
14	133E7629G001	H 8027
15	133E7629G001	H 8042
16	133E7629G001	H 8036
17	133E7629G001	H 8043
18	133E7629G001	H 8037

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3.3.5 Fuel Nozzles

Part Condition: Poor

Part Description:

Disassembly

All 18 Fuel Nozzles were removed as a part of standard CI (Combustion Inspection). Before disassembly of Fuel Nozzles all Pigtails and Tubing were removed. All Fuel Nozzles were removed from respective locations after marking their location number, proper rigging arrangement was used to remove, lift Fuel Nozzles and store them in laydown area for inspection purpose. After removing the Fuel Nozzles FME covers were applied to all the Fuel Nozzle openings in Combustion Cans to prevent any foreign material inclusion. All the gaskets were discarded after removing the Fuel Nozzles.

Clean and Inspect

All removed Fuel Nozzles were examined for various inspection points, the details of which are mentioned below

- Fuel Nozzle Collar wear - Light
- Support frame weld cracks - None
- Impingement cooling plate cracks - None
- Burning or loss of material - Light
- Coking in fuel nozzle tips - High

Assembly

Refurbished Fuel Nozzles were installed after removing FME covers. New gaskets were installed on all FWD Combustion Can gasket recess fit & proper compression of gasket was checked followed by bolts torqueing. BI was done from cold side of Combustion hardware for all openings. All Nozzles were free of any kind of foreign particles.

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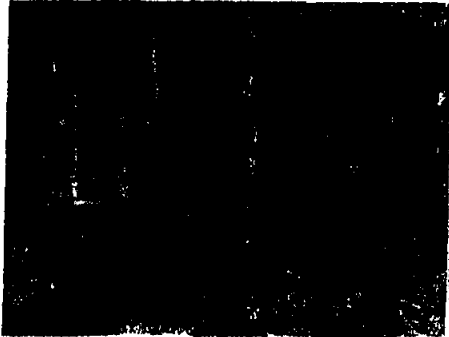
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GE Power Power Services

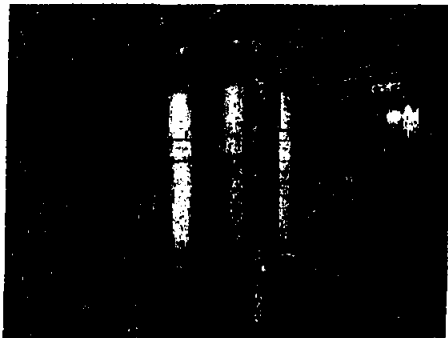
3.3.5 Fuel Nozzles



Old Fuel Nozzle



New Fuel Nozzle



Fuel Nozzle

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GT7130 FN End Cover PIPO



INSPECTION REPORT
Gas Turbine Maintenance

Combustion

End Cover Serial Numbers

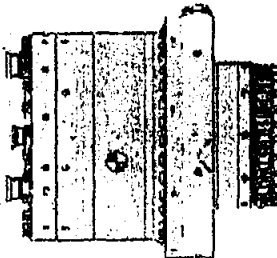
Equipment Type: 9FA.01

Date: 27/05/2022 Turbine S/N: 299041

Prepared by: Zafar Iqbal

FSR #: _____

Instructions: Request the as running part information from the Support Central Site link below.
<https://myproductlife.ny.ge.com/icpr/pages/icprhome.html>
Parts Life Database requires access



Enter Nozzle Type: DLN1

End Cover / Fuel Nozzle Assembly

Combustion Chamber Number (Out)	Dwg Number / Part Number (Out)	Serial Number (Out)
1	138E5772G021	30130-4/1304G14
2	138E5772G021	30130-4/1304G07
3	138E5772G021	30130-4/1304G05
4	138E5772G021	30130-4/1304G08
5	138E5772G021	16GL31865
6	138E5772G021	16GL31624
7	138E5772G021	30130-4/1304G04
8	138E5772G021	30130-4/1304G10
9	138E5772G021	16GL31698
10	138E5772G021	16GL31607
11	138E5772G021	30130-4/1304G03
12	138E5772G021	30130-4/1304G12
13	138E5772G021	16GL31305
14	138E5772G021	16GL32043
15	138E5772G021	16GL32053
16	138E5772G021	30130-4/1304G15
17	138E5772G021	30130-4/1304G09
18	138E5772G021	16GL32158

Combustion Chamber Number (In)	Dwg Number / Part Number (In)	Serial Number (In)
1	138E5772G021	30130-4/1304G06
2	138E5772G021	30130-4/1304G02
3	138E5772G021	30130-4/1304G11
4	138E5772G021	30130-4/1304G16
5	138E5772G021	16GL32041
6	138E5772G021	16GL32049
7	138E5772G021	16GL31635
8	138E5772G021	30130-4/1304G01
9	138E5772G021	16GL32143
10	138E5772G021	16GL31627
11	138E5772G021	16GL31302
12	138E5772G021	16GL32050
13	138E5772G021	30130-4/1304G13
14	138E5772G021	16GL32047
15	138E5772G021	16GL31304
16	138E5772G021	16GL31614
17	138E5772G021	30130-4/1304G17
18	138E5772G021	30130-4/1304G18

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GT7130 FN End Cover PIPO



INSPECTION REPORT
Gas Turbine Maintenance

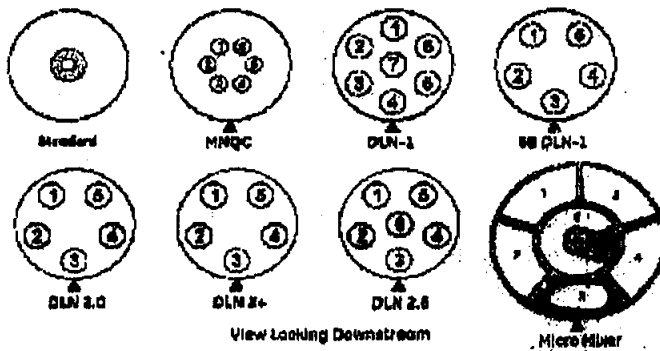
Definitions & Nomenclature

Definitions

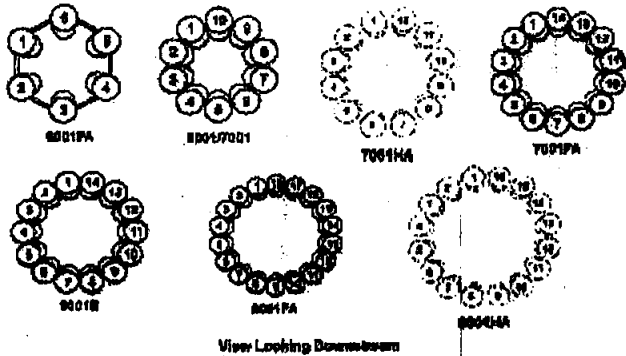
- Assembly Dwg. No. -** The higher level drawing above the individual part drawing
- Part Dwg. No. Out -** The design identification number of each part removed from the gas turbine during an outage or inspection.
- Part Dwg. No. In -** The design identification number of each part installed on the gas turbine during an outage or inspection.
- Serjal No. Out -** A unique number assigned to each individual part removed from the gas turbine.
- Serjal No. In -** A unique number assigned to each individual part installed on the gas turbine.

Nomenclature

Nozzle Configurations



Chamber Arrangements



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GT7130 Sheet: (Definitions) Rev 1.3 - 03/10/2020

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3.3.6 Pigtails and Tubing

Part Condition: Good

Part Description:

Disassembly

All Piping and Tubing were labeled and tagged prior to disassembly with respect to their location and system they are part of as a standard procedure of Major Inspection. TIL 1585-R1 was implemented during the removal of Flex Hoses. All the Pigtails were covered from both ends as FME protection. Tubing was also removed from Combustion system with care and stored in laydown area. Tubing was also covered from both ends as FME protection.

Clean and Inspection

The removed piping was examined for various inspection points the details of which are mentioned below

Pigtails and piping

- Hose Attachment weld cracks - Light
- Corrosion - Medium
- Signs of damage - Light
- Cracks and deformation in internal convolutions - Light
- Corrosion in internal convolutions - Light
- Internal flow liner weld crack - None
- Dents - Light

Tubing

- Signs of damage - Light
- Bend Tubing - Light
- Dents in Tubing - Light
- Cut Marks - None

Assembly

All New Pigtails and Old Liquid Fuel Tubing with new 3 Way Valve was assembled after

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3.3.6 Pigtails and Tubing

complete inspection and air blowing to remove any debris or dirt inside them. Match making and labeling was re-verified again after the complete assembly to eliminate any chance of swapping or wrong installation. Only Crew qualified for Tube fittings was used for installation of Tubing to ensure zero leakages. After completion of Major inspection mechanical works, Liquid Fuel system was tested.



New Pigtails



Pigtails-1

3.3.7 Spark Plugs

Part Condition: Fair

Part Description:

Disassembly:

Spark Plugs were removed from Can # 2 & 3 as a part of standard CI (Combustion Inspection) and stored in I&C Store for inspection. Respective Can # was marked on the Spark Plug and it was placed in I&C Store.

Clean and Inspect

The removed Spark Plugs were examined for various inspection points and no observations were found.

Assembly

Old Spark Plugs were tested before installation. Installed after thoroughly inspection on Can

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3.3.7 Spark Plugs

2 & 3 during assembly replaced all Gasket with new Gasket and Torqueing bolts as per GE Specification.



Spark Plug



Spark Plug-1

3.3.8 Combustion Liners

Part Condition: Fair

Part Description:

Disassembly

All 18 Combustion Liners were removed as a part of standard CI (Combustion Inspection). Liners disassembly was started from the topmost Chamber and continued both sides coming downwards. Respective Can # was marked on the Liner and it was placed in laydown area.

Clean and Inspect

The removed Combustions Liners were examined for various inspection points, the details of which are mentioned below.

- Liner cooling holes crack - Light
- Liner stop cracks, wear or deformation - None
- Liner Spring seals for cracks, distortion, missing leaves, bent leaves - Light
- Liner rivets cracks - Light

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3.3.8 Combustion Liners

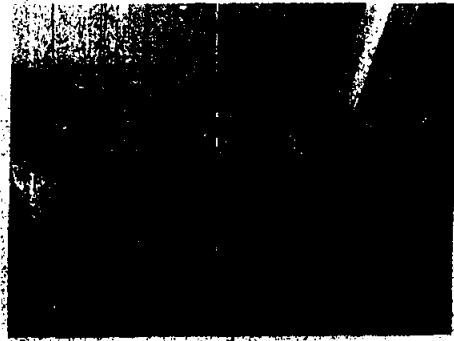
- Crossfire Tube collars for cracks, wear and distortion - Light

Assembly

All Liners were replaced with Refurbished Liners and their Part Numbers are available in PIPO Section. Liners were rigged and installed in their respective Combustion Can location and Liner stops were fully seated on Flow Sleeve stops. Proper engagement of Liner Hula seal with Transition Piece was checked during the installation.



Old Liners



New Liners

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GT 299041 Liner

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INSPECTION REPORT
Gas Turbine Maintenance
All Frame Sizes

Combustion
Combustion Liner

02/06/2022

299041

Zafar Iqbal

Combustion Chamber Number (Out)	Dwg Number / Part Number (Out)	Serial Number (Out)
1	101T4977G001	17-02-1656
2	101T4977G002	17-02-814
3	101T4977G002	17-02-815
4	101T4977G001	17-02-1657
5	101T4977G001	17-02-1658
6	101T4977G001	17-02-1659
7	101T4977G001	17-02-1660
8	101T4977G001	17-02-1661
9	101T4977G001	17-02-1662
10	101T4977G001	17-02-1663
11	101T4977G001	17-02-1664
12	101T4977G001	17-02-1665
13	101T4977G001	17-02-1666
14	101T4977G001	17-02-1667
15	101T4977G003	17-03-1403
16	101T4977G003	17-03-1404
17	101T4977G003	17-03-1405
18	101T4977G003	17-03-1406

Combustion Chamber Number (In)	Dwg Number / Part Number (In)	Serial Number (In)
1	101T4977G001	16-03-533
2	101T4977G002	17-07-863
3	101T4977G002	17-07-864
4	101T4977G001	16-03-534
5	101T4977G001	16-03-535
6	101T4977G001	16-03-536
7	101T4977G001	16-03-537
8	101T4977G001	16-03-538
9	101T4977G001	16-03-539
10	101T4977G001	16-03-540
11	101T4977G001	16-03-541
12	101T4977G001	16-03-542
13	101T4977G001	16-03-543
14	101T4977G001	16-03-544
15	101T4977G003	17-03-2426
16	101T4977G003	17-03-2427
17	101T4977G003	17-03-2428
18	101T4977G003	17-03-2429

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3.3.9 Inner and Outer Crossfire Tubes and Hardware

Part Condition: Fair

Part Description:

Disassembly

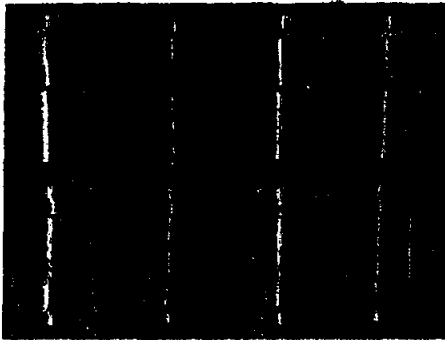
All 18 Inner and Outer Crossfire Tubes were removed as a part of standard CI (Combustion Inspection). Inner Crossfire Tube constitute of a male and female part. Inner Crossfire Tubes were removed first after pulling out the liners. After removal of Inner Crossfire Tubes, Outer Crossfire Tubes were disassembled, all the Outer Crossfire Tubes were number marked before disassembly. Old gaskets removed were discarded..

Clean and Inspect

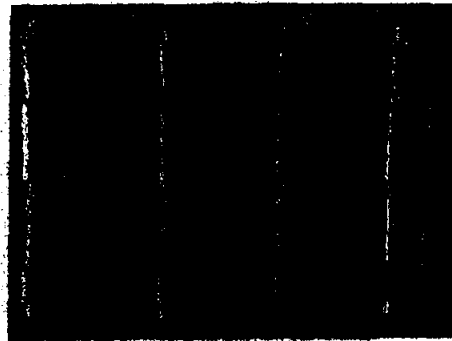
The removed Inner and Outer Crossfire Tubes were examined for various inspection points, and there were none to light observations. Outer Crossfire Tubes were reused after complete inspection. Gasket fit was cleaned for new gasket installation.

Assembly

Old Inspected Outer Crossfire Tubes which were removed during the disassembly were installed making sure the even allowable compression of gasket to eliminate the chance of any kind of leakage. After installation of all Outer Crossfire Tubes and completing the assembly of all the TPs and flow sleeves, New Inner Crossfire Tubes Male and Female were installed along with the installation of Liners. New Retainers were used to lock the Inner Crossfire Tubes in place. It was made sure that all Crossfire Tubes were in same orientation i.e. Male Crossfire Tube is oriented counterclockwise to the Female Crossfire Tubes.



New X-Fire Tubes-2



New X-Fire Tubes-1

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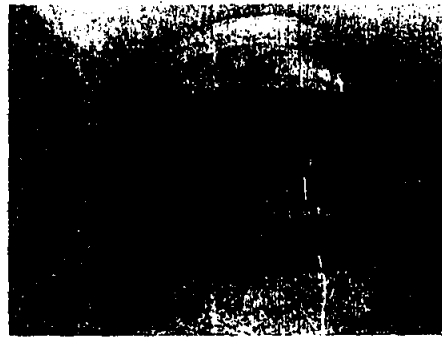
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3.3.9 Inner and Outer Crossfire Tubes and Hardware



Outer X-Fire Tube-1



Outer X-Fire Tube

3.3.10 Transition Pieces and Hardware

Part Condition: Fair

Part Description:

Disassembly

All 18 Transition Pieces were removed as a part of standard CI (Combustion Inspection). Transition Piece was disassembled by removing the side Seals and unlocking the bear claw plate. Transition Pieces were then disengaged from the inner and outer floating seal grooves and was removed from the Combustion section after proper marking. It was then lifted and placed in laydown area as decided earlier.

Clean and Inspect

The removed TPs were examined for various inspection points, the details of which are mentioned below:

- Aft. circular mount for weld or body cracks on inside and outside surface - Light
- Aft. frame/body corners for weld or body cracks - Light
- Fwd. support ring for weld or body cracks on inside and outside surface - None
- Floating seals for cracks and worn surfaces - Light
- Fwd. mounting lugs for cracks - None

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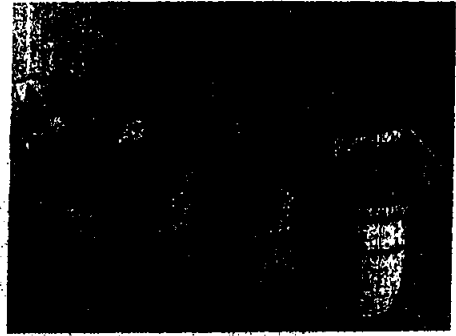
3.3.10 Transition Pieces and Hardware

Assembly

Refurbished Transition Pieces were installed during the assembly process. New Consumables were used during the installation of Transition Pieces, which include side Seals, side Seal retaining bolt and Spider lock tabs. Transition Pieces were installed and secured from both Fwd. and Aft. Side. Side Seal were installed and secured as well. Closing Setback Clearances were taken and found to be within the limits.



IMG 2848



New TP

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TP 299041

g INSPECTION REPORT
Gas Turbine Maintenance
All Frame Sizes

Combustion Transition Piece

Date: 02/06/2022 Turbine S/N: 299041
FSR #: _____

Prepared by: Zafar Iqbal

Instructions: Request the as running part information from the Support Central Site link below.
http://supportcentral.ge.com/servlet/sup_jcoacase_home.asp?prod_id=25688&case_category_id=18047

Combustion Chamber Number (Out)	Dwg Number / Part Number (Out)	Serial Number (Out)
1	117T5219G0002	17-07-1202
2	117T5219G0002	17-07-1203
3	117T5219G0002	17-07-1204
4	117T5219G0002	17-07-1205
5	117T5219G0002	17-07-1206
6	117T5219G0002	17-07-1207
7	117T5219G0002	17-07-1208
8	117T5219G0002	17-07-1209
9	117T5219G0002	17-07-1210
10	117T5219G0002	17-07-1211
11	117T5219G0002	17-07-1212
12	117T5219G0002	17-07-1213
13	117T5219G0002	17-07-1214
14	117T5219G0002	17-07-1215
15	117T5219G0002	17-07-1216
16	117T5219G0002	17-07-1217
17	117T5219G0002	17-07-1218
18	117T5219G0002	17-07-1219

Combustion Chamber Number (In)	Dwg Number / Part Number (In)	Serial Number (In)
1	117T5219G0002	17-01-081
2	117T5219G0002	17-01-082
3	117T5219G0002	17-01-083
4	117T5219G0002	17-01-084
5	117T5219G0002	17-01-085
6	117T5219G0002	17-01-086
7	117T5219G0002	17-01-087
8	117T5219G0002	17-01-088
9	117T5219G0002	17-01-089
10	117T5219G0002	17-01-090
11	117T5219G0002	17-01-091
12	117T5219G0002	17-01-092
13	117T5219G0002	17-01-093
14	117T5219G0002	17-01-094
15	117T5219G0002	17-01-095
16	117T5219G0002	17-01-096
17	117T5219G0002	17-01-097
18	117T5219G0002	17-01-098

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GT3225 TP to Nozzle Setback Opening



INSPECTION REPORT
Gas Turbine Maintenance

MS6001 (All), 7001 (All), 9001 (All)

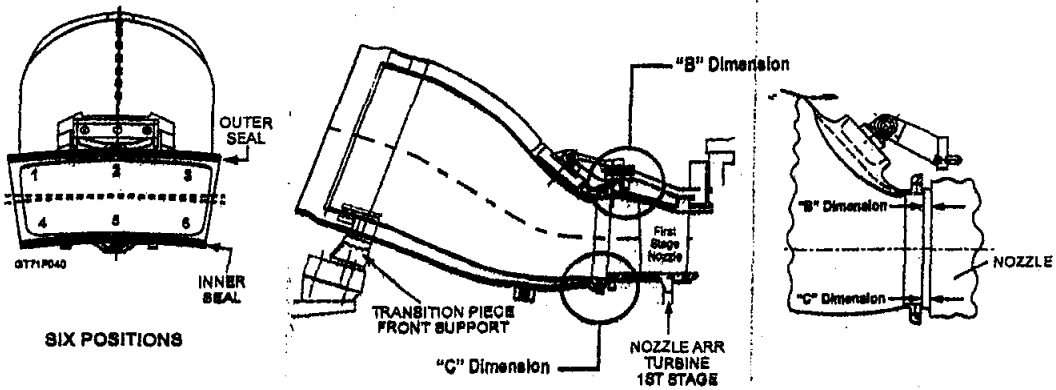
Combustion

Transition Piece to Nozzle Setback

Date 14/7/2021
FSR # _____

Turbine S/N 299041

Prepared by Zafar Iqbal
Units: Inches



NOTE: Force nozzle segments downstream before checking clearances. Dimension are taken between the 1st stage nozzle sidewall and the transition piece aft end frame. Measurements are to be taken with feeler gauges or a vernier.

	0.118	0.122	0.115	0.170	0.182	0.180
	0.130	0.120	0.115	0.190	0.180	0.188
	0.109	0.130	0.136	0.166	0.170	0.193
	0.125	0.123	0.139	0.162	0.165	0.190
	0.105	0.120	0.125	0.180	0.195	0.190
	0.160	0.165	0.143	0.200	0.233	0.200
	0.115	0.120	0.130	0.150	0.200	0.110
	0.105	0.110	0.136	0.154	0.169	0.160
	0.135	0.130	0.145	0.190	0.170	0.180
	0.113	0.135	0.150	0.175	0.180	0.178
	0.130	0.135	0.150	0.180	0.190	0.195
	0.133	0.110	0.115	0.160	0.170	0.200
	0.096	0.109	0.117	0.132	0.146	0.159
	0.092	0.116	0.122	0.135	0.142	0.156
	0.090	0.130	0.133	0.130	0.140	0.157
	0.102	0.135	0.149	0.145	0.153	0.166
	0.112	0.148	0.153	0.152	0.147	0.172
	0.111	0.137	0.150	0.142	0.155	0.183

Comments:
As found Set back clearances of all 18 TP,s

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GT3225 TP to Nozzle Setback Close



INSPECTION REPORT
Gas Turbine Maintenance

MS6001 (AII), 7001 (AII), 9001 (AII)

Combustion

Transition Piece to Nozzle Setback

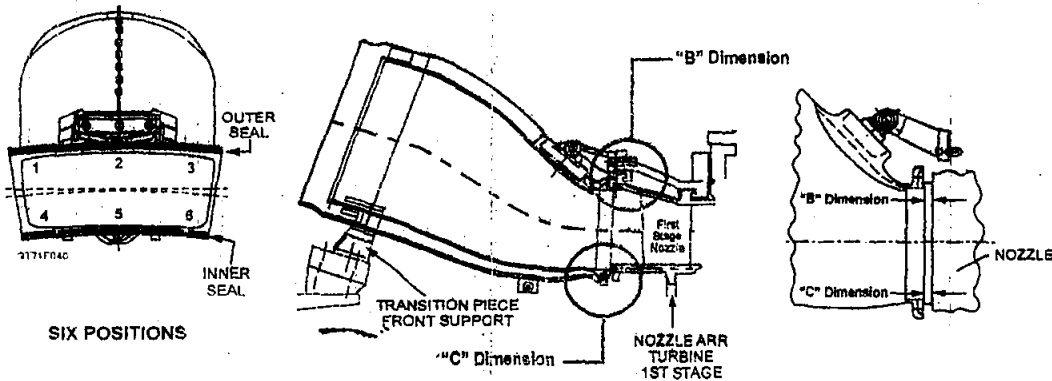
Date 13-June-2022

Turbine S/N 299041

Prepared by Mostafa Ramdan

FSR #

Units: Inches



NOTE: Force nozzle segments downstream before checking clearances. Dimension are taken between the 1st stage nozzle sidewall and the transition piece aft end frame. Measurements are to be taken with feeler gauges or a vernier.

	0.195	0.150	0.185	0.338	0.311	0.307
	0.145	0.152	0.142	0.237	0.242	0.230
	0.138	0.130	0.146	0.210	0.238	0.221
	0.160	0.157	0.200	0.276	0.286	0.286
	0.110	0.118	0.130	0.186	0.200	0.210
	0.116	0.111	0.140	0.157	0.129	0.132
	0.111	0.132	0.145	0.145	0.138	0.106
	0.095	0.114	0.133	0.128	0.101	0.098
	0.138	0.133	0.149	0.125	0.115	0.126
	0.144	0.114	0.133	0.148	0.117	0.130
	0.126	0.102	0.095	0.162	0.178	0.189
	0.145	0.138	0.107	0.182	0.217	0.203
	0.139	0.151	0.145	0.287	0.270	0.298
	0.158	0.146	0.130	0.365	0.336	0.322
	0.145	0.140	0.115	0.370	0.378	0.355
	0.156	0.180	0.196	0.382	0.388	0.376
	0.173	0.160	0.170	0.365	0.385	0.375
	0.190	0.183	0.181	0.330	0.343	0.335

Comments:

B 0.189 - 0.349
C 0.197 - 0.417

3.3.11 Bore Plug

Part Condition: Good

Part Description:

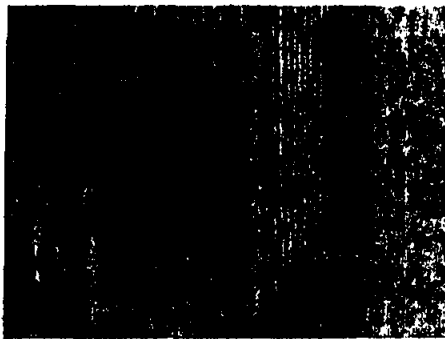
As per engineering recommendation, post AGP upgrade the unit was in operation with TWO bore plugs open, keep as is and replace the Bolt with a Plug on Can # 18.



IMG 3191



IMG 3190



IMG 3222



IMG 3221

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3.4 Turbine Section

3.4.1 Turbine Clearances

Part Condition: Good

Part Description:

As found Turbine half-shell clearances taken and recorded in inspection form after removal of upper half Turbine Casing. Rotor was pushed back on Active side before taking Turbine clearances. Final Turbine half Shell clearances were taken after Rotor was pushed back on Active side. Install upper half Turbine Shell Casing after ER Case disposition and tightened all Horizontal and Vertical bolts as per GE Specification.

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GT9390 Turbine rotor Close clearances



INSPECTION REPORT
Gas Turbine Maintenance

Turbine

Turbine Rotor Clearances

Equip Code: Select

Date: 13/06/2022

Turbine S/N: 299041

Prepared by: Zafar Iqbal

ERP Job #: _____

As Found Clearance Drw: _____

Units of Measure: Inches

As Left Clearance Drw: _____

Rotor Trusted Toward: Exhaust

All axial clearances are measured with rotor against the thrust face as defined on the unit's MLI 0404 Clearance drawing.

Stage	OPENING		CLOSING		Stage	OPENING		CLOSING	
	Left	Right	Left	Right		Left	Right	Left	Right
A SE7	2.392	2.389	2.394	2.391		0.417	0.420	0.378	0.349
1P2	0.278	0.284	0.287	0.284		0.721	0.670	0.995	0.960
1P3	0.511	0.495	0.534	0.534					
1P4	0.281	0.281	0.298	0.273		0.413	0.488	0.385	0.428
1P5	0.611	0.597	0.636	0.655		0.571	0.517	0.360	0.509
1A2	0.414	0.443	0.411	0.466					
1A3	1.051	1.104	0.801	0.922		0.418	0.441	0.438	0.395
1A4	1.034	1.089	0.433	0.526		0.409	0.423	0.438	0.387
1A5	0.423	0.430	0.417	0.457		0.737	0.657	0.462	0.551
1PL	0.394	0.374	0.436	0.356					
1PH	0.393	0.385	0.433	0.354		0.303	0.276	0.298	0.325
1PA	0.545	0.621	0.461	0.482		0.278	0.268	0.282	0.313
1R	0.329	0.322	0.260	0.223					
I	0.010	0.010	0.015	0.013		0.563	0.513	0.679	0.680
						0.528	0.579	0.672	0.760
						0.566	0.511	0.791	0.732

Stage	OPENING		CLOSING	
	Left	Right	Left	Right
3P2	0.503	0.525	0.506	0.468
3P3	0.732	0.777	0.904	0.802
3A1	1.017	1.057	0.380	0.409
3A2			1.009	0.995
	0.311	0.299		
3S-1	0.308	0.297	0.298	0.354
3S-2	0.289	0.299	0.288	0.331
3SA-1	0.694	0.718		
3SA-2	0.692	0.713	0.743	0.715
3F	0.688	0.705	0.712	0.694
	0.685	0.681	0.747	0.742

Comments: _____

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GT9390 Turbine Clearance Drawing

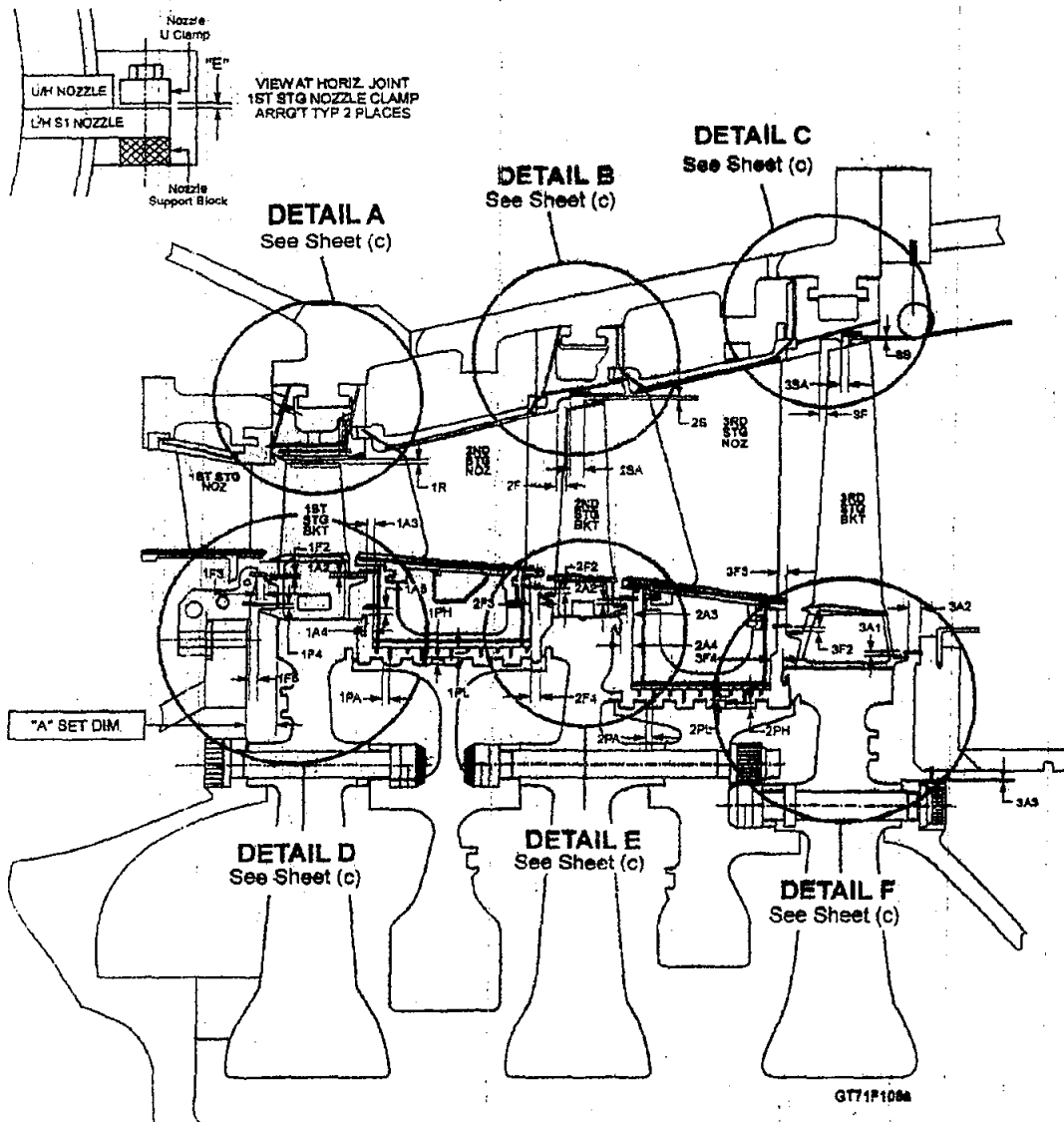


INSPECTION REPORT
Gas Turbine Maintenance

Equip Code: 9F.01

Turbine
Turbine Rotor Clearances

The section of a clearance drawing shown below and on the following page displays clearance locations which are not required to be recorded for turbine maintenance outages.



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3.4.2 Turbine Casing

Part Condition: Good

Part Description:

Disassembly

Horizontal joint body bound bolts were unfastened followed by the removal of the Vertical and Horizontal joint bolts. All these bolts were disassembled using the ITH bolts set up. The Casing was then lifted using the jacking bolts, guide pins and the rigging set up and was placed on wooden blocks in the laydown area.

Clean & Inspect

After the disassembly, the Turbine Casing was Flipped on the Aft end Vertical Flange and Scaffolding was erected to remove the upper half shrouds and nozzles and examine the Turbine Casing for various inspection points. No observations were found. Both the Vertical and Horizontal Flanges were Oil Stoned and cleaned for any high spots.

Assembly

Before installation of Turbine Casing BI of lower half Turbine Section was done and after satisfaction that there is no foreign material left in Turbine Casing lower half, only then upper half was lifted for installation. It was ensured that the Horizontal joint Seals in the lower half Shrouds and Nozzles were properly engaged with the respective upper half components and the Casing Horizontal joint is closed by its own weight. All casing bolts were then Torqued as per their sequence and Torque values. As a final quality check, 1.5 mils Feeler Gauge was used to check the closed joints that did not enter either of the Horizontal or Vertical joints.

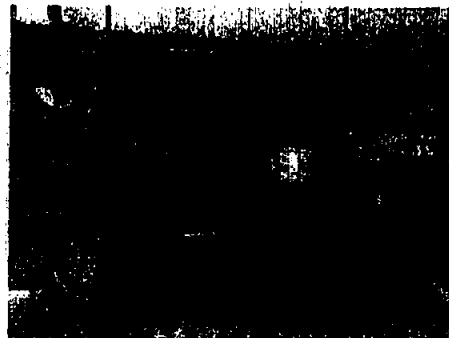
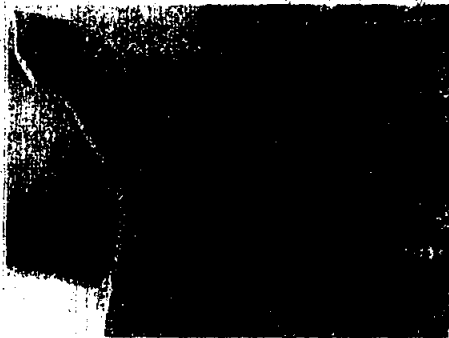


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3.4.2 Turbine Casing



3.4.3 Stage 1 Nozzles

Part Condition: Fair

Part Description:

Prior to the disassembly of the upper half 1st Stage Nozzle ring, the as found Concentricity checks were performed at six points. Once all the bolting is loosened, S1N upper half is removed by attaching a proper lifting arrangement. The lower half Nozzle Ring was rolled out using swivel eye bolts and chain falls and was rigged away in the laydown area where both upper and lower half S1N are joined together to check Ellipticity.

The New 1st Stage Nozzle Rings were joined to record the Ellipticity. Later, the lower half was rolled in using proper rigging equipment and the upper half was installed on top of it by engaging the dowel pins. The 12-point bolts at the Horizontal joint were engaged and torqued as per defined value. Concentricity check was performed and Concentricity was found within limits.

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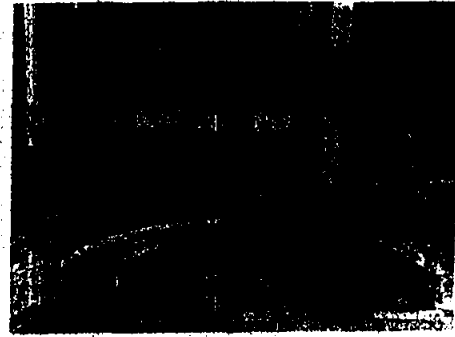
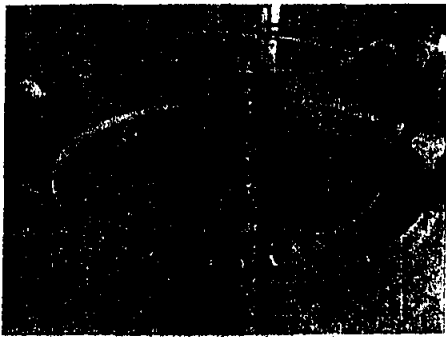
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3.4.3 Stage 1 Nozzles



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GT9245 1st Stage Nozzle Ellipticity & ...



INSPECTION REPORT
Gas Turbine Maintenance

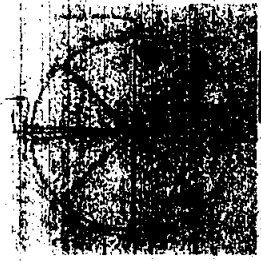
Turbine

9FA.03

1st Stage Nozzle Ellipticity & Radial Concentricity Checks

Date 31/05/2022 Turbine S/N 2999041 Prepared by Zafer Iqbal
 Project # _____ Sketches Attached? _____ Photos Attached? Yes

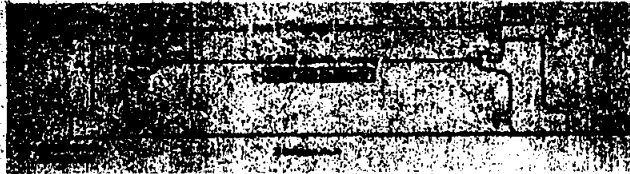
Measurement Units millimeters



CONDITION	A	B	C	D	E	Ellipticity
Disassembly						
Reassembly	29.750	29.750	29.740	29.740	29.750	-0.005'

Ellipticity = (B+C+D+E)/4 - A Maximum Ellipticity (USL) **1.270'**

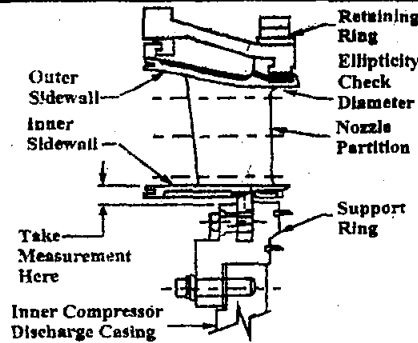
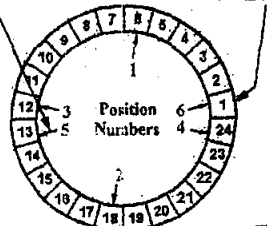
NOTE: Take diameter readings at the inside diameter of the downstream end of the outer sidewall and at the center of the nozzle segment.



Radial Concentricity Checks

NOTE:
Take Measurement To Center Of Nozzle Segment

Nozzle Segment Numbers Looking Downstream



CONDITION	NOZZLE TO SUPPORT RING DIMENSION						MAXIMUM ECC.
	POS. #1	POS. #2	POS. #3	POS. #4	POS. #5	POS. #6	
Disassembly							
Reassembly	1.440	1.454	1.375	1.375	1.380	1.380	0.007'

Maximum Eccentricity = 1/2 Difference Between #1 and #2
 Or Maximum Eccentricity = 1/2 Difference Between (#3+#5)/2 and (#4+#6)/2
 Whichever is Larger. Maximum Eccentricity (USL) **1.270'**

Comments: _____

New Nozzle Part # 10716377G0012

Serial # SNH J31631089

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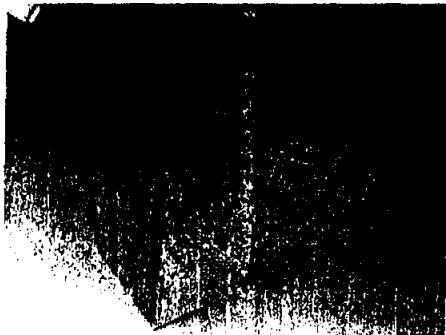
3.4.4 Stage 1 Shrouds

Part Condition: Fair

Part Description:

All the Stage 1 Shrouds were marked with reference to their position before disassembly. Respective Pins were removed from all Shrouds and labeled accordingly. After the removal of the Pins, the Shrouds were removed by sliding them out through the hook fits. All the inter-Shroud Seals and the Circumferential seal were collected and discarded. Moreover, the Turbine Casing hook fits were cleaned, and all the rough surfaces were smoothed.

The Old Shrouds were re-used and inserted in the cleaned hook fits of the Turbine Casing and slid to their respective position for installation. Once positioned, new retaining Pins were installed. After the installation of the Shroud Pins, New Circumferential Seal was installed between the Shrouds and the Turbine Casing.



3.4.5 Stage 1 Buckets

Part Condition: Poor

Part Description:

The Turbine Buckets were removed by a qualified Bucket Technician. During the removal, it was ensured that the Rotor is held in place. All the respective Seals and Platform Pins and lock wires that were removed were counted and kept safe. After the removal of buckets, the dovetail slots were cleaned and smoothed for any high faces.

The New Set of S1B were renumbered as per the positions mentioned in the moment weight chart. Moreover, the New Pins and Seals were installed in the respective slots using sealant

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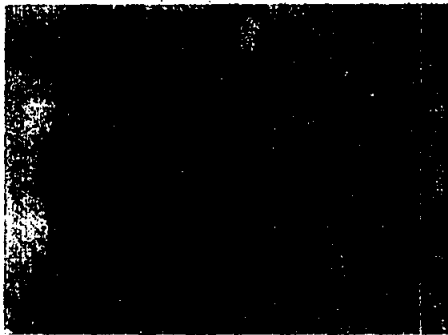
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3.4.5 Stage 1 Buckets

which were left to dry. Later, the newly numbered Buckets with the newly installed pins were installed in the dovetail slots and locked in their positions.



OLD S1B



New S1B



Buckets Installed on Rotor



Buckets Installation

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3.4.6 Stage 2 Nozzles

Part Condition: Poor

Part Description:

All the S2N were marked with reference to their position before disassembly. The retaining plugs and their respective pins were removed followed by removal of Nozzle Segments by sliding them out through the sliding fits using rigging setup for both upper and lower half. All the Seals collected during disassembly were discarded. S2N were found with heavy deposits, erosion and nicks.

The New 2nd Stage Nozzles were installed with New Cloth Seals. The Nozzle Segments were slid to position into the sliding fits of the shrouds. Once positioned, new retaining pins, were installed and the plug was installed and torqued to its respective value. After the complete installation of the Nozzles, new V-Seal was installed between the Shrouds and the Nozzles.



Old S2N



New S2N

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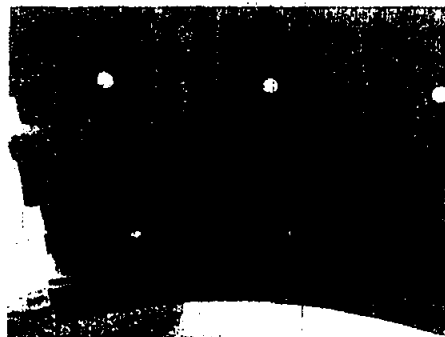
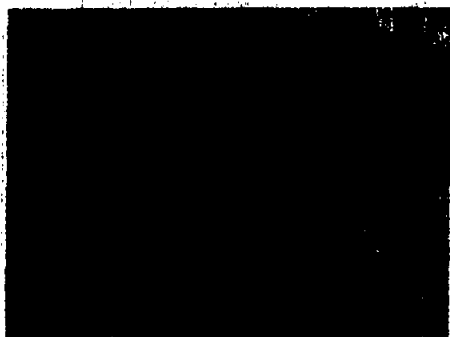
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3.4.7 Stage 2 Shrouds

Part Condition: Fair

Part Description:

All the Stage 2 Shrouds were marked with reference to their position before disassembly. Respective pins were removed from all shrouds and labeled accordingly. After the removal of the pins, the Shrouds were removed by sliding them out through the hook fits. All the inter-shroud seals and the circumferential seal were collected and discarded. Moreover, the Turbine Casing hook fits were cleaned, and all the rough surfaces were smoothed. The Old Shrouds were inserted in the cleaned hook fits of the Turbine Casing and slid to their respective position for installation. Once positioned, new retaining pins were installed. After the installation of the Shroud Pins, new circumferential seal was installed between the Shrouds and the Turbine Casing.



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3.4.8 Stage 2 Buckets

Part Condition: Fair

Part Description:

The Turbine Buckets were removed by a qualified bucket technician. During the removal, it was ensured that the Rotor is held in place. All the respective seals and platform pins and lock wires that were removed were counted and kept safe. After the removal of Buckets, the Dovetail slots were cleaned and smoothed for any high faces. NDT was performed on the slots to record any damages

The Old Set of S2B were renumbered as per the positions mentioned in the moment weight chart. Moreover, the new pins and seals were installed in the respective slots using sealant which were left to dry. Later, the newly numbered buckets with the newly installed pins were installed in the dovetail slots and locked in their positions.

Recommendation Status: Should be planned for next Outage

Recommendation Type: Parts

Recommendation Description:

Plan replacement of 2nd Stage Buckets in next opportunity.



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3.4.9 Stage 3 Nozzles

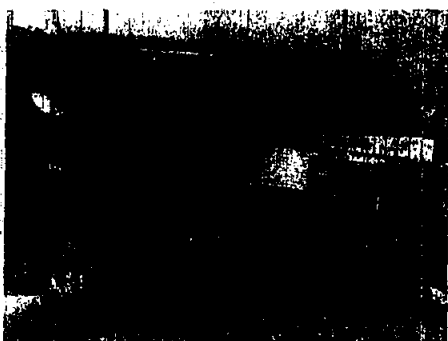
Part Condition: Good

Part Description:

All the S3N were marked with reference to their position before disassembly. The retaining plugs and their respective pins were removed followed by removal of Nozzle Segments by sliding them out through the sliding fits using rigging setup for both upper and lower half. All the Seals collected during disassembly were discarded.

The Old Nozzles were installed with new Cloth Seals. The Nozzle Segments were slid to position into the sliding fits of the Shrouds. Once positioned, new retaining pins, were installed and the plug was installed and torqued to its respective value. After the complete installation of the Nozzles, new V-Seal was installed between the Shrouds and the Nozzles.

NOTE: During disassembly found Thermocouple broken inside of Nozzle Segment # 7 and we tried to remove that broken thermocouple but its very hard and stuck so replaced old Segment # 7 with New Segment # 7.



UH 3rd Stage Nozzle



LH 3rd Stage Nozzle

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3.4.10 Stage 3 Shrouds

Part Condition: Good

Part Description:

All 3rd Stage Shrouds were marked with reference to their position before disassembly. Respective pins were removed from all Shrouds and labeled accordingly. After the removal of the pins, the Shrouds were removed by sliding them out through the hook fits. All the Inter-Shroud Seals and hard Seal were collected and discarded. Moreover, the Turbine Casing Hook fits were cleaned, and all the rough surfaces were smoothed.

The Old Shrouds were inserted in the cleaned hook fits of the Turbine Casing and slid to their respective position for installation. Once positioned, New retaining pins were installed. After the installation of the Shroud Pins, new Cloth Joint Seal was installed between the Shrouds to Shroud and the Hard Seal installed on Horizontal joint of Turbine Casing.



3rd Stage Shrouds



3rd Stage Shrouds-1

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3.4.11 Stage 3 Buckets

Part Condition: Good

Part Description:

The Turbine Buckets were removed by a qualified Bucket Technician. During the removal, it was ensured that the Rotor is held in place. All the respective Seals and Platform Pins and Lock Wires that were removed were counted and kept safe. After the removal of Buckets, the Dovetail slots were cleaned and smoothed for any high faces.

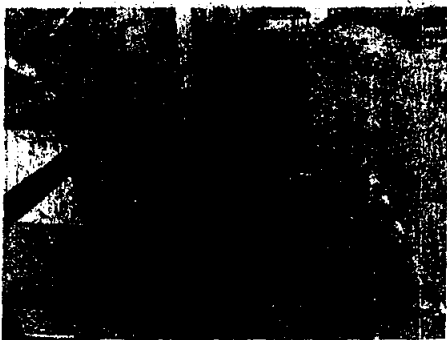
The Old set of S3B were renumbered as per the positions mentioned in the moment weight chart. Moreover, the New Pins and Seals were installed in the respective slots using sealant which were left to dry. Later, the newly numbered Buckets with the newly installed Pins were installed in the Dovetail slots and locked in their positions.

Recommendation Status: Should be planned for next Outage

Recommendation Type: Parts

Recommendation Description:

Required replacement of 3rd Stage Buckets in next opportunity or do BI inspection when it is possible.



3rd Stage Bucket-1



3rd Stage Bucket in position

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3.5 Exhaust Section

3.5.1 Exhaust Casing

Part Condition: Good

Part Description:

Exhaust Casings was disassembled and removed. Inner bolting was removed between Exhaust Frame and Exhaust Diffuser. After vertical bolting, horizontal bolting was removed from outside and then followed by inside of the exhaust casing. After all the unbolting was complete Exhaust Casing was lifted following the critical lift plan and secured in lay down area.

New Horizontal joint Inconel Mesh Gasket were installed at both outer and inner joints. Critical lift plan was followed during the lift and Exhaust Casing was installed at its place; all the horizontal joint dowels were tightened first followed by torquing of all horizontal joint bolts from outer horizontal joint and inner horizontal joint bolts. After horizontal joint all the vertical joint bolts were torqued from outer and inner vertical joints. When all the bolting from outer and inner barrel was complete, weld stiffeners were removed.



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3.5.2 Exhaust Diffuser

Part Condition: Good

Part Description:

Exhaust Diffuser inspection:

Exhaust Diffuser, Load Tunnel and Load Compartment were inspected for various inspection points, details for which is given below.

- Cracks on diffuser body - None
- Wear on Diffuser Vanes - None
- Diffuser Vanes Edge Damage - None
- Damage to Insulation pads - Light

Load Tunnel and Load compartment Inspection

- 88TK cooling holes blockage - None
- Casing half joint flue gas leakage marks on the inside - None
- Flex Seals loosened with broken bolts - None
- Loss of insulation behind flex seal - None
- Burning marks on flex seal showing signs of leakage - None
- Compartment not completely sealed (loss of ventilation) - None
- Ventilation Pipe damage - None
- Ventilation Fans damper Stuck - None



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3.6 Unit Rotor

3.6.1 Unit Rotor

Part Condition: Poor

Part Description:

Unit Rotor (Compressor and Turbine Rotor combined) was removed. Axial and Radial rotor retaining guides were installed to limit the movement of rotor. Lifting beam and associated riggings were attached with the unit rotor as per the critical lift plan. Lay down area for Rotor was prepared prior to lifting the Rotor. Unit Rotor was lifted and placed in laydown area on Rotor Stands. Extreme care was taken to ensure that Rotor blades and buckets didn't touch any Stator and Nozzle Segments. Once Rotor was removed the Lower half Turbine and Compressor sections were available for cleaning and inspection.

Old Rotor was replaced with new rotor and before installation it was made sure that all the guides which were used to remove the unit rotor were in place Lower half Compressor and Turbine sections were checked for the FME that there were no FME hazards. Lifting Beam and associated riggings were attached as per the critical lift plan. Pre lift meeting was conducted to cover and discuss all the aspects of Rotor lifting. In addition to. Unit Rotor was lifted following the lift plan and it was placed at its place on both Journals Bearing lower halves. During lowering of unit Rotor, it was made sure that there was no physical contact of Rotor and stationary components.

Old Rotor Part # 145E2555G022 Rev-000 (146E1844G007 Rev-000) FOM 1239510UT

New Rotor Part # 101T7366G020 (101T7365G017) FOM 4277845

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LARGE CALL-OUT - 299041

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3.6.1 Unit Rotor



New Rotor



Old Rotor-1

3.6.2 T2 Journal Bearing

Part Condition: Fair

Part Description:

Disassembly

Journal Bearing Tilting Pad # 2 was disassembled and removed. Bearing housing was unbolted, lifted and secured in lay down area. Oil and Air Seals from upper half Bearing Housing were removed for installation of new ones. Bearing Tilting Pad upper half was removed from the shaft and secured in lay down area for the inspection. At that point all the opening Bearing # 2 Seals clearances were measured and recoded. After securing the rotor in lay down area the lower half Bearing was removed as well and secured in laydown area where it was re-assembled with the already removed upper half Bearing.

Clean and Inspect

The removed T3 Journal bearing and oil seals were examined for various inspection points, the details of which are mentioned below.

- Cracks - None
- Scoring - Light
- Deeper Scratches - None

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3.6.2 T2 Journal Bearing

- Wiped Babbitt - Light
- Excessive Wear - None
- Burning Marks - None
- Chippings In Babbitt - None

Stationary Oil Seals Condition

- Wear - Light
- Bend Teeth - None
- Coking deposits - Light
- Burning Marks - None

Assembly

Before assembly of Bearing # 2 It was ensured that Bearing # 2 drain line was clear from any kind of foreign materials and there was no FME loss. All the diametral measurements for New Bearing Tilting Pad were checked and verified. New Bearing Tilting Pad lower half was installed and along with it all New lower half stationary oil seals and oil deflectors were installed. After securing lower half Bearing Tilting Pad and seals Shaft is lowered to rest on the lower half Bearing. Bearing # 2 Closing clearances were taken and upper half Bearing Tilting Pad was installed. New Upper half stationary oil seals were installed in upper half bearing housing. Bearing # 2 Tilting Pad upper half was installed followed by installation of Bearing Housing and all the bolts were torqued as per bolting and torquing instructions.



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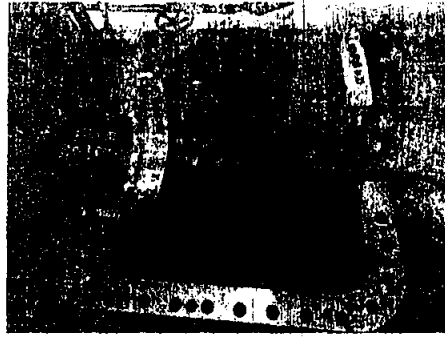
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3.6.2 T2 Journal Bearing



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GT2060 Bearing # 2 Seal Clearances F...



INSPECTION REPORT
Gas Turbine Maintenance

Bearings

Bearing & Seal Clearances, No. 2

9FA.02

Date 09/06/2022 Turbine S/N 299041 Prepared by Zafar Iqbal
 FSR # _____ Data Type _____ Photos Enclosed? _____
 Unit of Measure Inch Sketches Enclosed? _____
 Unit Clearance Drawing: _____

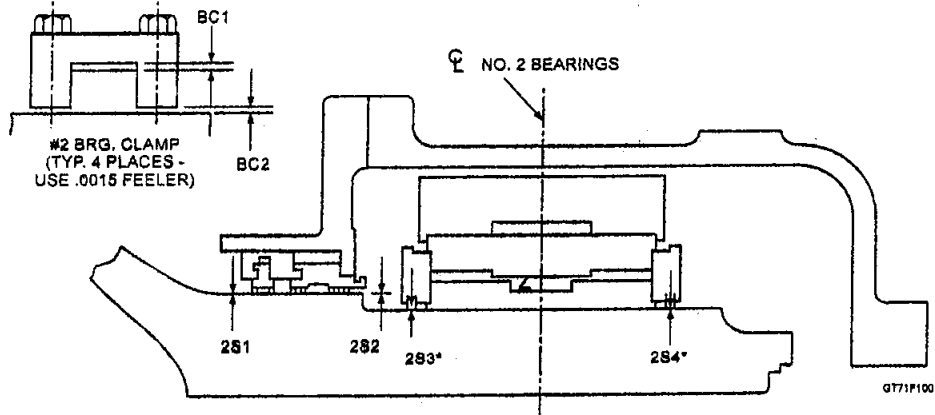
All Views
with Turbine Flow

CONDITION CODE:

M - Missing Metal
W - Worn
CR - Cracked

DISPOSITION CODE:

N - No Repair or Replacement Necessary
R - Repaired
RN - Replaced with New Component



SEAL INSPECTION

DIM	Clearances				Visual Inspection		Comments
	Left	Right	Top	Bottom	Condition	Disposition	
281	0.022	0.018					
282	0.020	0.018					
283*			0.014				21.696 inside Micrometer
284*			0.013				21.696 inside Micrometer

DIM	FWD STRAP		AFT STRAP	
	LEFT	RIGHT	LEFT	RIGHT
BC1	0.000	0.000		
BC2	0.000	0.000		

* Measure total ring float at each location.

Comments:
Floating Seals:

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3.6.3 T1 Journal Bearing

Part Condition: Fair

Part Description:

Disassembly

Journal bearing # 1 and thrust bearings were disassembled and removed. Bearing housing was disassembled by removing all the bolts and dowels which were labeled and secured accordingly. All stationary oil seal and oil deflector as found clearances were checked and recorded in relevant inspection form. Bearing upper half was removed and secured in laydown area. After securing the rotor in lay down area the lower half Bearing was removed as well and secured in laydown area where it was re assembled with the already removed upper half Bearing and diametral checks were carried out. After journal bearing removal, thrust bearing was removed. Both active and non-active side Shims were removed, labeled and secured in lay down area. Similarly, the active and non-active side bearing housing including the bearing pads were removed after numbering and labeling.

Clean and Inspect

The removed T1 Journal Bearing, thrust bearing and Oil Seals were examined for various inspection points, the details of which are mentioned below.

- Cracks - None
- Scoring- Light
- Deeper Scratches- ~~Light~~
- Wiped Babbitt- None
- Excessive Wear- None
- Burning Marks- None
- Chippings in babbitt- None

Assembly

Before installing bearing all the diametral measurements for new tilting pad bearing were checked and verified. New tilting pad bearing lower half was installed and along with it all lower half stationary oil seals and oil deflectors were installed. After securing lower half tilting pad bearing and seals shaft was lowered to rest on the lower half tilting pad bearing.

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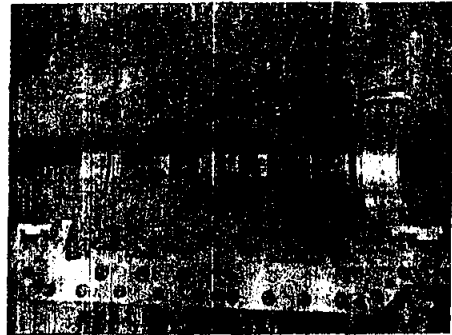
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3.6.3 T1 Journal Bearing

upper half tilting pad bearing were installed. Upper half stationary oil seals were installed in upper half bearing housing. After completing the assembly of journal bearing, New Thrust Bearing was installed, Active and Non-Active side Thrust Bearings were installed respectively along with the Old Shims. Float was checked afterwards and found 0.006" which was not as per specs. Active Shim was sent for machining and after installing modified shim, float was checked again and found within GE specs 0.011". After completing the thrust bearing assembly and float measurement bearing housing was installed and all bolts were torqued.



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GT2025 Bearing # 1 Seal Clearance Fi...



INSPECTION REPORT
Gas Turbine Maintenance

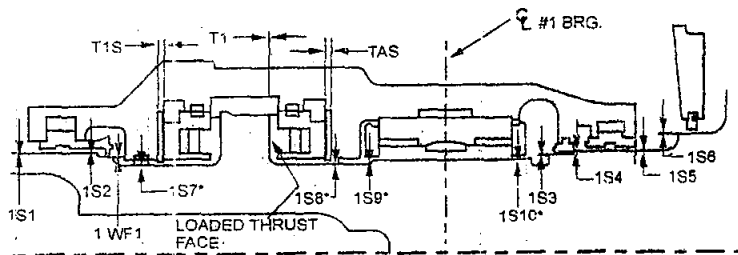
9FA.02

Bearings

Bearing & Seal Clearances, No. 1

Date: 08/06/2022 Turbine S/N: 299041 Photos Enclosed? No Prepared by: Zafar Iqbal
PSR #: _____ Sketches Enclosed? No Units of Measure: Inch

- All axial clearances are measured with rotor against the loaded thrust face. Refer to EMS260 to confirm rotor position.
- All views with turbine flow.



CONDITION CODE

M - Missing Metal
W - Worn
CR - Cracked

DISPOSITION CODE

N - No Repair or Replacement Necessary
R - Repaired
RN - Replaced with New Component

GT71F103

SEAL INSPECTION

DIM	Clearances								Visual Inspection		
	Left	Top	Right	Bottom	Left	Top	Right	Bottom	Condition	Disposition	Comments
1S1	0.030		0.025		0.023		0.026				
1S2	0.012		0.024		0.023		0.026				
1S3	0.020		0.024		0.023		0.025				
1S4	0.024		0.024		0.023		0.026				
1S5	0.026		0.022		0.023		0.025				
1S6	0.023		0.024		0.024		0.025				
1S7		0.005				0.005					
1S8		0.007				0.006					
1S9		0.006				0.015					21.696 Inside Micrometers
1S10		0.007				0.014					21.696 (Inside Micrometers)
1WF1					0.025		0.026				

DIM	Description	Measurement		Insp. Data	Comments
		As Found	As Left		
1S1	Seal Ring	0.011	0.012		* Measure total ring clearance at each location ** Shim thickness data and Dates auto populated from sheet (b)
1S2	Seal Ring	0.571	0.564		
1S3	Seal Ring	0.571	0.564		
1S4	Seal Ring	0.514	0.514		

Comments:		
Rub Ring as found: X	LHS	0.150"
	RHS	0.149"

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GT2025 Bearing # 1 Seal Clearance Fi...



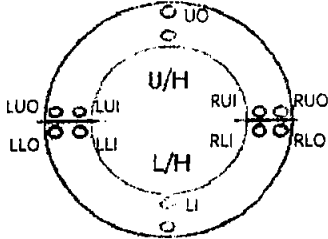
INSPECTION REPORT
Gas Turbine Maintenance

9FA.02

Bearings

Bearing & Seal Clearances, No. 1

Date 44720 Turbine S/N 299041 Prepared by Zafar Iqbal
 FSR # _____ Photos Enclosed? No Sketches Enclosed? No
 Units of Measure Inch



MEASURE LOCATION CODE

UO - Upper Outer
 UI - Upper Inner
 LUO - Left Upper Outer
 LUI - Left Upper Inner
 LLO - Left Lower Outer
 LLI - Left Lower Inner
 LO - Lower Outer
 LI - Lower Inner
 RUO - Right Upper Outer
 RUI - Right Upper Inner
 RLO - Right Lower Outer

CONDITION CODE

M - Missing Metal
 W - Worn
 CR - Cracked

DISPOSITION CODE

N - No Repair or Replacement Necessary
 R - Repaired
 RN - Replaced with New Component

Inspection Date:		As Found			As Left			
SHIM THICKNESS	DIM	As Found			As Left			COMMENTS
		Left	Top	Right	Left	Top	Right	
		Active						
Upper Half								
	Outer							
	Inner							
Lower Half								
	Outer							
	Inner							
Upper Half								
	Outer							
	Inner							
Lower Half								
	Outer							
	Inner							
AVERAGE THICKNESS								
		Active						
Upper Half								
Lower Half								
		Inactive						
Upper Half								
Lower Half								

Measurements above highlighted if any exceed .001" from average

Comments:

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3.6.4 Internal Alignment

Part Condition: Good

Part Description:

As found Alignment reading was recorded from Load Coupling to Generator Coupling. Alignment reading found misalign with Load to Generator. Removed side cover of Generator Foundation from left and right side, loosen all foundation bolts for movement of Generator from up and sides. Adjusted Alignment reading from Generator to Load Coupling and rechecked and found Alignment within GE Specification. Alignment data was recorded after unit assembly. Load Gear to Generator Alignment was done first and Generator was secured with GIB keys on both fwd. and aft. sides. Foundation Bolts were tightened and beveled off 0.010" and strips were welded between nut and stud. Installed back Foundation Side Covers left and right side and tighten bolts. Data sheet attached with this report.



Alignment check



Dial Munting on Generator

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6994

GT1010 Alignment As Found Generato...

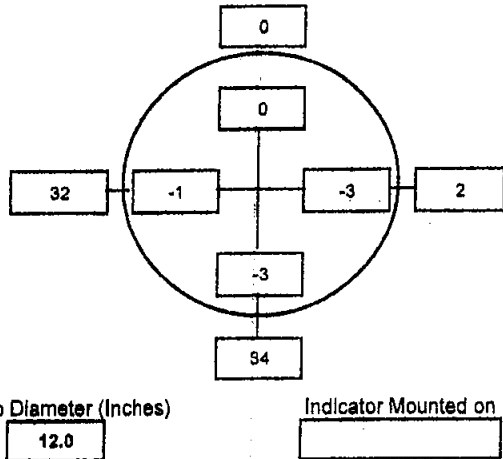
g *INSPECTION REPORT*
Gas Turbine Maintenance
MS 3002, 5001, 5002, 6001B, 7001E, 9001E

Alignment
Load Coupling

Date 19/6/2022 Turbine S/N 289041 Prepared by Asad Rehman
 FSR # _____ Sketches Enclosed? _____ Photos Enclosed? _____
 Data Type As found

Alignment Readings (Insert readings in mils)

Position	Top	Left	Right	Bottom
	0	32	34	2
	881	980	880	978
	908	908	903	905
	907	904	903	902
	897	897	892	893
	923	922	920	920
	0	-1	-3	-3

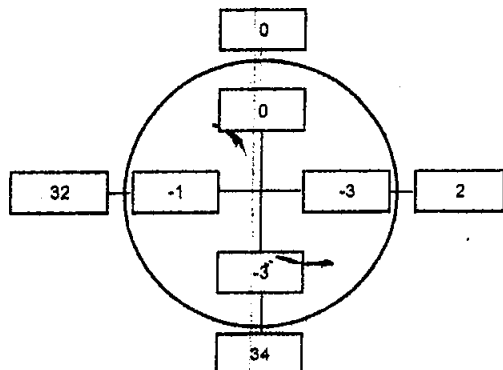


	Face	Rim
Top	-3.0	34.0
Bottom	-4.0	34.0
Left	1.0	0.0

NOTE:

1. Checks to be made in direction of turbine flow.
2. "Rim" readings should reflect indicator riding at coupling OD or on male rabbet; if indicator rides on female rabbet, the sign conventions must be changed.

Alignment Based on 12" sweep diameter.



Comments
Generator to Load Coupling Alignment taken. Dial indicator mounted on Generator Coupling and read on Load Coupling.

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GT1010 Alignment Final Generator to...



INSPECTION REPORT
 Gas Turbine Maintenance
 MS 3002, 5001, 5002, 6001B, 7001E, 9001E

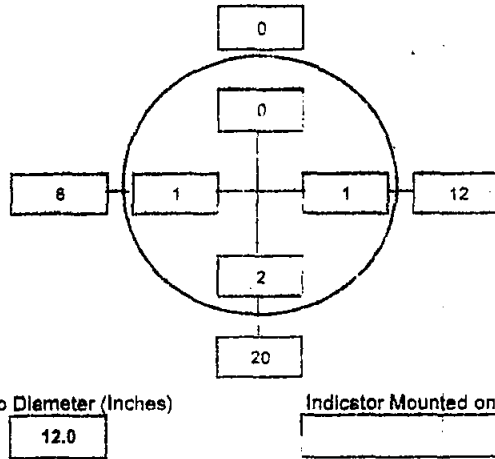
Alignment Load Coupling

Date 20/6/2022 Turbine S/N 299041 Prepared by Asad Rehman
 FSR # _____ Sketches Enclosed? _____ Photos Enclosed? _____
 Data Type Final

Alignment Readings (Insert readings in (mils))

Position	Top	Left	Bottom	Right
Rim	0	8	20	12
Face 0°	743	744	746	744
Face 90°	645	646	647	646
Face 180°	648	649	650	649
Face 270°	639	640	641	641
Average	669	670	671	670
Face	0	1	2	1

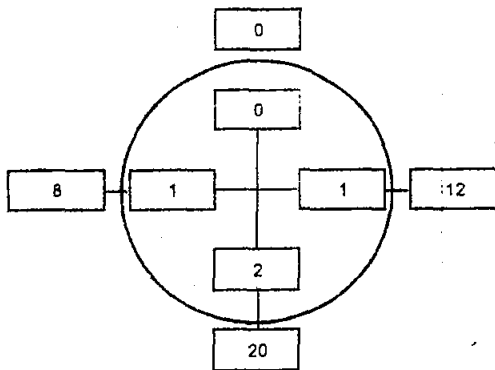
Check	Face	Rim
Top to Bottom	2.0	20.0
Right to Left	2.0	20.0
Difference	0.0	0.0



NOTE:

1. Checks to be made in direction of turbine flow.
2. "Rim" readings should reflect indicator riding at coupling OD or on male rabbet; if indicator rides on female rabbet, the sign conventions must be changed.

Alignment Based on 12" sweep diameter.



Comments
 Generator to Load Coupling Alignment taken.
 Dial indicator mounted on Generator Coupling
 and read on Load Coupling.

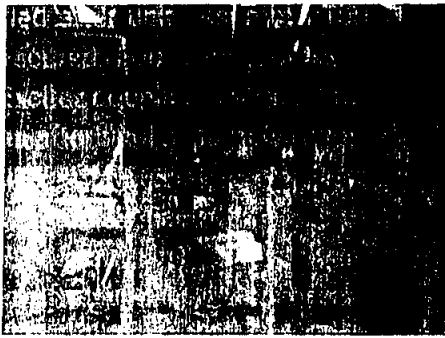
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3.6.5 Alignment Turning Gear to Generator

Part Condition: Good

Part Description:

As found Alignment reading was recorded from Turning Gear to Exciter Coupling, Alignment reading found misalign with Turning Gear to Exciter. Removed Top cover of Exciter and Carbon Bushes from top of Exciter Shaft, loosen all foundation bolts for movement of Turning Gear from up and sides. Adjusted Alignment reading from Turning Gear to Exciter Coupling and rechecked and found Alignment within GE Specification. Alignment data was recorded after unit assembly. Turning Gear to Exciter Alignment was done first and Exciter was secured. Foundation Bolts were fully tightened. Turning Gear coupling bolts tightened with Exciter coupling. Installed back top cover of Exciter and tighten bolts. Installed Carbon Bushes after final assembly of top cover of Exciter.



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GT1005 Alignment of Exciter to Turni...

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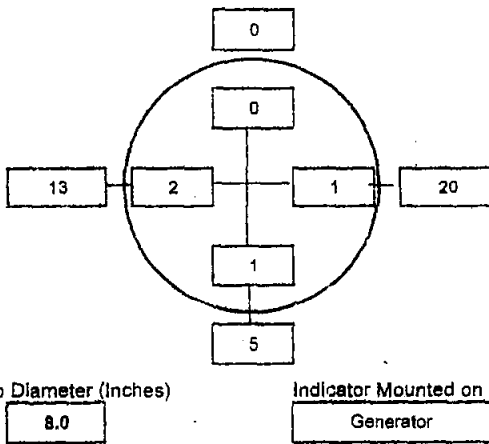
INSPECTION REPORT
 Gas Turbine Maintenance
 MS 3002, 5001, 5002, 6001B, 7001E, 9001E

Alignment Accessory Coupling

Date 21-06-2022 Turbine S/N 299041 Prepared by Mostafa Ramadan
 FSR # _____ Sketches Enclosed? _____ Photos Enclosed? _____
 Data Type Opening

Alignment Readings (Insert readings in mils)

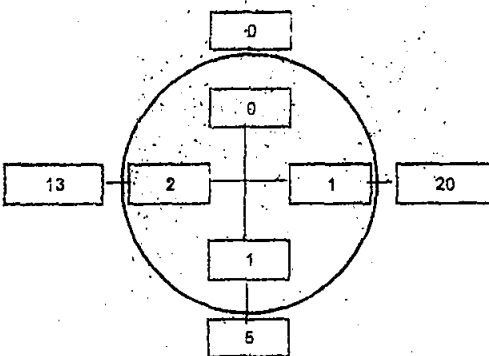
Reading	Top	Left	Right	Bottom
Rim	0	13	5	20
Face D	296	302	306	293
Face S	322	320	321	308
Face B	321	306	319	329
Face X	302	304	303	303
Average	302	304	303	303
Roll	0	2	1	1
Clearance		Face	Rim	
Top Bottom		1.0	5.0	
Rim Top		3.0	33.0	
Difference		-2.0	-28.0	



NOTE:

1. Checks to be made in direction of turbine flow.
2. "Rim" readings should reflect indicator riding at coupling OD or on male rabbit; if indicator rides on female rabbit, the sign conventions must be changed.

Alignment Based on 12" sweep diameter.



Comments
Alignment of turning gear rotor to Generator rotor

498

GT1005 Alignment of Exciter to Turni...

g

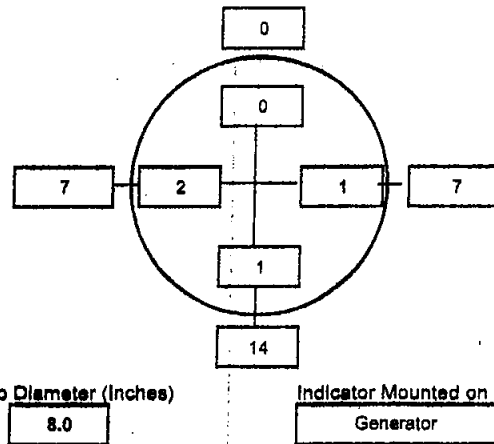
INSPECTION REPORT
Gas Turbine Maintenance
MS 3002, 5001, 5002, 6001B, 7001E, 9001E

Alignment
Accessory Coupling

Date 21-06-2022 Turbine S/N 299041 Prepared by Mostafa Ramadan
FSR # _____ Sketches Enclosed? _____ Photos Enclosed? _____
Data Type Closing

Alignment Readings (insert readings in (mils))

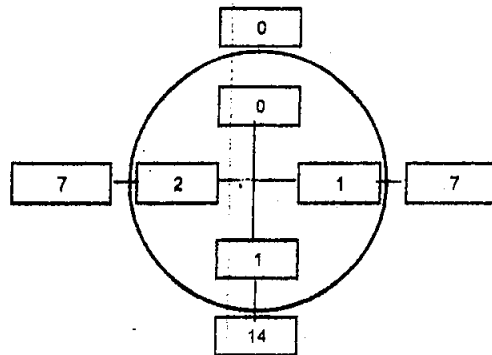
Indicator	Top	Left	Right	Bottom
	0	7	14	7
	302	304	303	303
	303	305	304	304
	301	303	402	302
	302	304	303	303
	302	304	303	303
	0	2	1	1
Face		Face	Rim	
		1.0	14.0	
		3.0	14.0	
		-2.0	0.0	



NOTE:

1. Checks to be made in direction of turbine flow.
2. "Rim" readings should reflect indicator riding at coupling OD or on male rabbet; if indicator rides on female rabbet, the sign conventions must be changed.

Alignment Based on 12" sweep diameter.



Comments
Alignment of turning gear rotor to Generator rotor

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3.6.6 Load Coupling and Coupling Bolts

Part Condition: Good

Part Description:

Load coupling was decoupled and removed as the standard part of MI procedure. It was made sure that tooling used including (Riverhawk) was inspected prior to use, testing certificates were checked. TIL 1702 was implemented during Load Coupling unbolting with Riverhawk tool. Coupling Bolts were removed, once all the bolts were removed opening Turbine to Generator Alignment reading was taken for the reference. Load Coupling cleaned and inspected

Load Coupling was assembled from the Turbine Rotor end and all New Coupling Bolts were stretched to 23 to 22 mils. Once Final Alignment readings were taken, Alignment was done and made sure that final reading was within the unit specific Alignment tolerance. Once the alignment was finalized, Coupling from Generator end was coupled as well. Coupling Bolts were installed from the Generator end and stretched to 20 to 25 mils



Load Coupling bolts



Coupling Guard

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GT5020 Load Coupling Bolts Final

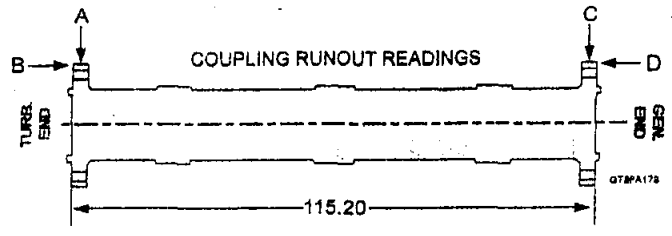


INSPECTION REPORT
Gas Turbine Maintenance
MS9001F

Coupling
Load

Date 14/06/2022 Turbine S/N 299041 Prepared by Mostafa Ramadhan
FSR # _____ Sketches Enclosed? _____ Photos Enclosed? _____
Data Type As Left

Vendor Serial # _____ GE Part # _____



NOTE: Runouts are to be taken at free end after load coupling is final bolted at other end.

COUPLING RUNOUT READINGS			
Runout	Turbine End	Generator End	Fit
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			

COUPLING INTERFERENCE FIT DIMENSIONS			
Male Dimension	Female Dimension	Fit	Runout

COUPLING BOLTS								
Bolt	TURBINE END				GENERATOR END			
	Initial	Ball Length	Checked	Runout	Initial	Ball Length	Checked	Runout
1	12.402	12.422	12.422	0.020	12.377	12.400	12.400	0.023
2	12.404	12.424	12.424	0.020	12.376	12.400	12.400	0.024
3	12.404	12.424	12.424	0.020	12.376	12.399	12.399	0.023
4	12.403	12.424	12.424	0.021	12.374	12.399	12.399	0.025
5	12.402	12.422	12.422	0.020	12.376	12.399	12.399	0.023
6	12.397	12.418	12.418	0.021	12.375	12.400	12.400	0.025
7	12.401	12.421	12.421	0.020	12.373	12.398	12.398	0.025
8	12.402	12.422	12.422	0.020	12.376	12.400	12.400	0.024
9	12.402	12.421	12.421	0.019	12.376	12.399	12.399	0.023
10	12.401	12.420	12.420	0.019	12.376	12.399	12.399	0.023
11	12.401	12.421	12.421	0.020	12.376	12.401	12.401	0.025
12	12.400	12.419	12.419	0.019	12.374	12.398	12.398	0.024
13	12.405	12.425	12.425	0.020	12.375	12.399	12.399	0.024
14	12.401	12.421	12.421	0.020	12.376	12.400	12.400	0.024
15	12.404	12.425	12.425	0.021	12.376	12.399	12.399	0.023
16	12.407	12.427	12.427	0.020	12.375	12.400	12.400	0.025
17	12.401	12.421	12.421	0.020				
18	12.403	12.423	12.423	0.020				

Comments:

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4 Controls System

4.1 Disassembly

4.1.1 Instrumentation Removal

Part Condition: Fair

Part Description:

Outage started with the removal of instrumentation from GT roof. Limit Switches of all the Ventilation fans were disconnected from Marshalling cabinet and tagged. Cables were rolled back and cable trays were removed.

Details:

- Motors Connection 88CM, 88tk1, 88 tk2, 88BM1, BM2 removed
- Cable back pulling of all instruments and meters on rooftop
- Roof cable tray removed
- Instrument tubing on rooftop
- Hazardous Gas Detector

After removing all the instruments and cable connections from roof, instrumentation and cable connection in turbine Compartment was followed.

Details:

- All Wheel space Thermocouple removed and lengths were taken
- All CTM Thermocouple removed
- Flame Detector removed with their Cables
- Sparkplug and their cables removed
- Thermowell Measurements for all wheel space, CTM and CTD Thermocouple
- Instrument tubing and Conduit removed in turbine area
- CDM removed and back pulling of cable
- All Heat detectors removed



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4.2 Bearing Metal Thermocouples

4.2.1 Bearing #1 Metal

Part Description:

As part of the outage scope new metal Temperature TCs were installed and connected to the JB.



Brg1 Metal TC

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4.2.2 Bearing #2 Metal

Part Condition: Fair

Part Description:

New Thermocouples were installed and connected to the HMI. Confirmation was confirmed from HMI Screen.



Bearing 2 Metal TCs

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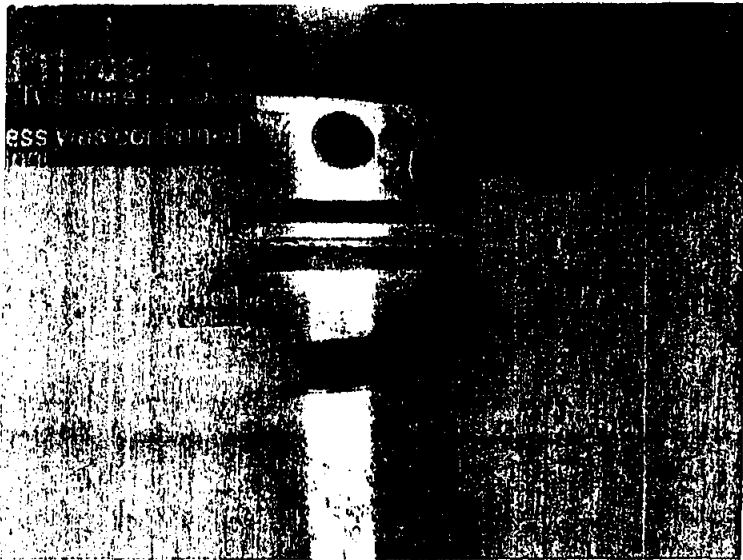
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4.2.3 Active Thrust Metal

Part Condition: Good

Part Description:

Both Active pads TCs were removed and replaced with new. TC routing was done and spot welded, healthiness was confirmed from the HMI after connections in JB.



Active Pads TC

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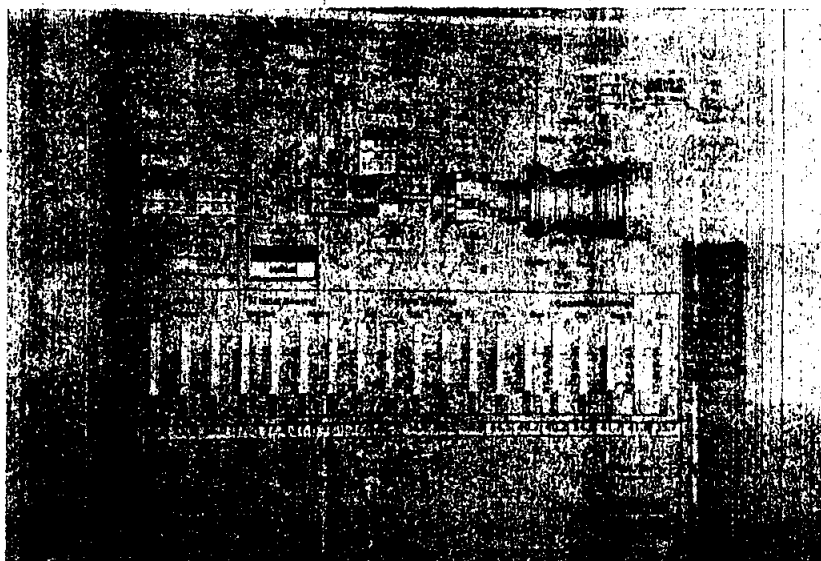
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4.2.4 Inactive Thrust Metal

Part Condition: Good

Part Description:

Both In-Active pads TCs were removed and replaced with new TCs. This was done and spot welded.



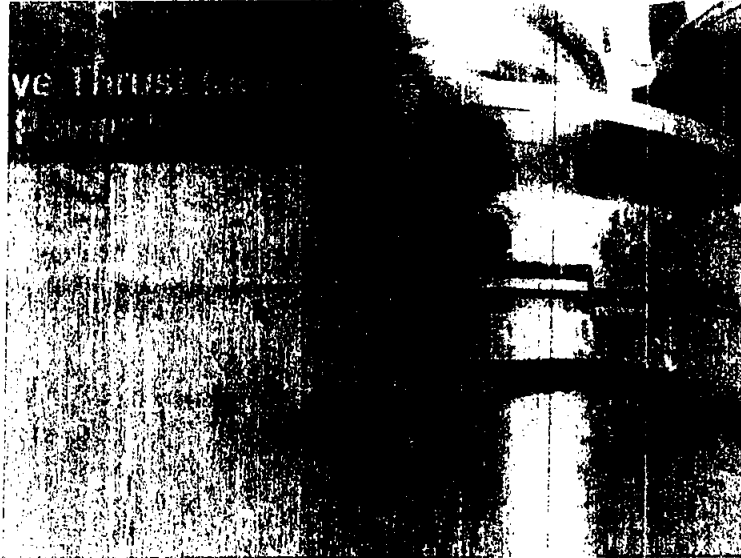
Bearing TCs Healthiness

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4.2.4 Inactive Thrust Metal



In-Active Pads TC

4.3 Speed Probes

4.3.1 Primary Speed Probes

Part Condition: Good

Part Description:

Resistance of 77NH-1/2/3 was taken (~200Ohm) and gap was adjusted as per device summary (1.270+0.1270 mm).

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4.3.1 Primary Speed Probes



Speed Pickup Probes

4.3.2 Emergency Over Speed Probes

Part Condition: Good

Part Description:

Resistance of 77HT-1/2/3 was taken (~2000hm) and gap was adjusted as per device summary (1.270±0.1270 mm).

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4.4 TSI Vibration

4.4.1 Bearing #1 Bently Nevada Instrumentation

Part Condition: Fair

Part Description:

Both Radial Probes and extension cables were replaced and Gap voltage was adjusted to -10VDC.

4.4.2 Bearing #1 Seismic Instrumentation

Part Description:

New Seismic Probes were Installed and Knock test was performed after connections, to verify the loop.

4.4.3 Bearing #2 Bently Nevada Instrumentation

Part Condition: Good

Part Description:

Both Radial Probes were replaced and Gap Voltage was adjusted to -10VDC.

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4.4.3 Bearing #2 Bently Nevada Instrumentation



Bearing 2 Radial Probes

4.4.4 Bearing #2 Seismic Instrumentation

Part Description:

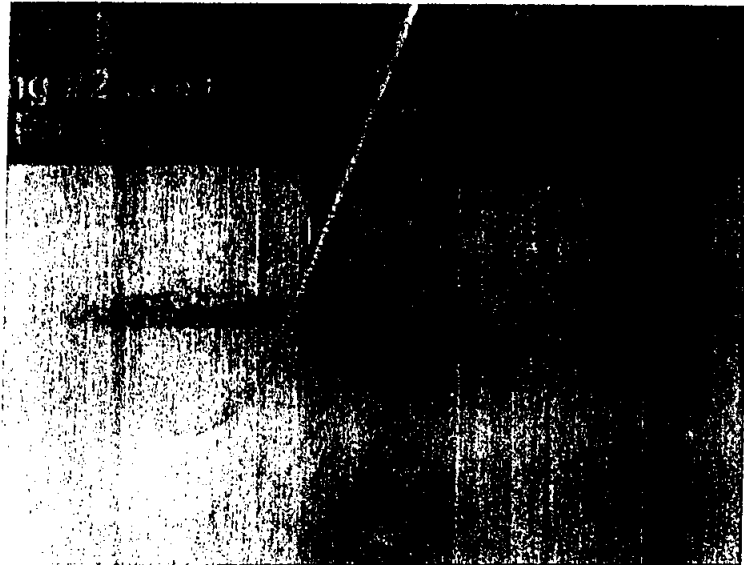
New Seismic Probes were installed and Knock test was performed to check the loop healthiness.

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4.4.4 Bearing #2 Seismic Instrumentation



Bearing 2 Seismic Probes

4.4.5 Bently Nevada Key Phasor

Part Description:

77RP-11 was replaced with new probe and Gap Voltages were adjusted to -10VDC. Functionality of the sensor was verified at turning gear speed.

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4.4.6 Axial Position Probes

Part Description:

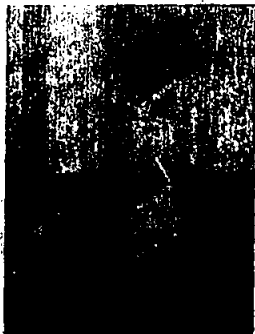
Both Axial Position Probes were replaced and gap voltage was 1st adjusted to -8VDC. Float adjustment was done by mechanically jacking the rotor to the in-active/active side.

4.5 Wheel Space Thermocouples

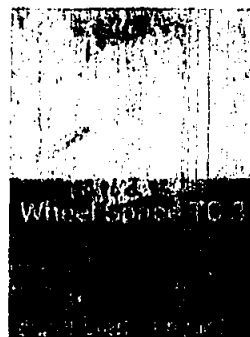
4.5.1 1st/2nd and 3rd Stage

Part Description:

All new Thermocouples were installed as per the Outage scribble. Healthiness was checked for blockage. Healthiness was verified at FSNL.



Wheel Space TC 2



Wheel Space TC 3

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4.6 Compressor Discharge Thermocouples

Part Description:

All 3 Compressor Discharge TCs were replaced with new sensors.



STD Thermocouple

4.7 EFM Valves

Part Description:

Both EFM valves were found to be in-operational, upon troubleshooting the feedback cable was found damaged and thus replaced. Valves became normal and command/ Feedback was comparable during the stroke Test.

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4.8 Flame Scanners

Part Description:

New Flame Scanners were installed and loop was tested by applying Torch light to verify healthiness.

4.9 Igniters

Part Description:

New Igniters were installed along with the cables. Functional test was also performed by forcing ignition permissive and spark was verified.

4.10 Fire Detectors

4.10.1 Turbine Compartment

Part Description:

Turbine Compartment Fire detectors were tested in the heat bath to check actuation as per device summary settings (315 degC). Loop healthiness with respect to shorting/grounding was also verified.

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4.11 Combustible Gas Detectors

Part Condition: Poor

Part Description:

Only 1 out of 4 Gas sensors were found working in Turbine compartment and site didn't have any spare sensors to replace the faulty ones. Issue has been raised with site CPM.

Recommendation Status: Should be planned for next Outage

Recommendation Type: Parts

Recommendation Description:

This catalytic type sensing system is not reliable and has become obsolete, its highly recommended to upgrade to an aspirated detection system to ensure reliability of the safety critical devices.

4.12 Compartment Fans and Switches

4.12.1 Turbine Compartment Fans

Part Condition: Poor

Part Description:

Switches of the BT fans were faulty and were found forced at site. New switches were installed after calibration by the customer team, functional test was performed as part of the start up checklist.

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4.12.2 Exhaust Frame Blowers

Part Description:

Switches of the TK fans were faulty and were found forced at site. New switches were installed after calibration by the customer team, functional test was performed as part of the start up checklist.

4.12.3 #2 Bearing Areas Blowers

Part Description:

Switches of the BN fans were faulty and were found forced at site. New switches were installed after calibration by the customer team, functional test was performed as part of the start up checklist.

4.12.4 Accessory Compartment Fans

Part Description:

Functional test was performed as part of the start up checklist.

4.12.5 Load Compartment Fans

Part Description:

Functional test was performed and limit switch operation was verified.

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4.13 Compressor Bleed Valves

Part Description:

Bleed valves were stroked and verified for smooth Operation.

- Opening Time : ~1.68 secs
- Closing Time : ~0.54 secs

4.14 Inlet Bleed Heat

4.14.1 IBH Control Valve

Part Description:

IBH valve was stroked from 0-100% and operation was verified from the field. Feedback was within 1% error for the operational range.

4.15 Fuel Gas Valves

4.15.1 Stop/Speed Ratio Valve

Part Description:

Valve was stroked & calibration was verified. Command/ Feedback was found within 0.5% tolerance.

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4.15.2 Auxiliary Stop Valve

Part Description:

Valve was stroked and operation of the limit switches was verified.

4.15.3 PM1 Gas Valve

Part Condition: Good

Part Description:

Valve was stroked & calibration was verified. Command/ Feedback was found within 0.5% tolerance.

4.15.4 PM2 Gas Valve

Part Condition: Good

Part Description:

Valve was stroked & calibration was verified. Command/ Feedback was found within 0.5% tolerance.

4.15.5 PM3 Gas Valve

Part Condition: Good

Part Description:

Valve was stroked & calibration was verified. Command/ Feedback was found within 0.5% tolerance.

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4.15.6 PM4 Gas Valve

Part Description:

Valve was stroked & calibration was verified. Command/ Feedback was found within 0.5% tolerance.

4.15.7 P2 Pressure Vent Valve

Part Condition: Good

Part Description:

Valve was stroked and operation of the limit switches was verified.

4.15.8 Fuel Gas Purge Valves

Part Condition: Fair

Part Description:

All the Gas/Liquid fuel Purge Valves were stroked and timings was adjusted per the device summary. DVC of VA13-2 was found failing to close the valve to 50% after full sweep so it was adjusted to 80% opening as site didn't have the equivalent spare.

Recommendation Status: Should be planned for next Outage

Recommendation Type: Parts

Recommendation Description:

Site should order the equivalent Purge valve for VA13-2 and spare DVC.

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4.16 Inlet Guide Vanes & Dump Valve (20TV)

Part Description:

IGV was stroked and functional test of 20TV was performed. After stroke test angles were measured before and after auto calibration procedure, all the readings were found within the acceptable range.

CC3710

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Inspection and Test
Data Sheet

Digital Control

Inlet Guide Vane Calibration

Date: 21/06/22 Unit Serial Number: 299041 Performed by: Muhammad Harris Malik
Outage Number: EV-126207 Control System: MKVle

Inlet Guide Vane Calibration:

LVDY Feedback Voltage Check

Device	State	Voltage
96TV-1	Fully Open	3.20
96TV-1	Fully Closed	0.70
96TV-2	Fully Open	3.25
96TV-2	Fully Closed	0.70

Servo Coil Polarity Check

Coil	Polarity	Movement
<R>	Correct	Smooth
<S>	Correct	Smooth
<T>	Correct	Smooth

Servo Valve Null Bias Check

Coil	Current
<R>	0.25
<S>	0.26
<T>	0.29

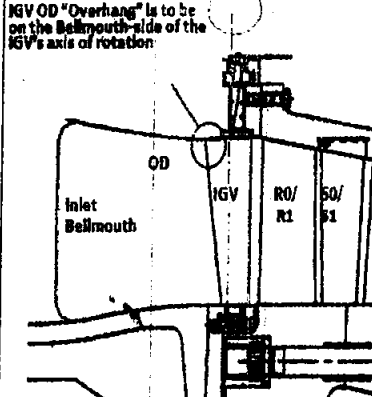
*Note: Values are in Amperes

As Found Min & Max Position *

CSGV settings	Min	Max
	23	86

Pre-Calibration - Actuator Electrical Stop			
Quadrant	Vane #	Closed Angle	Open Angle
Quadrant 1	1	23.00	86.00
	5	23.00	86.00
	9	23.00	86.50
	13	23.00	86.50
Quadrant 2	17	23.00	86.00
	21	23.50	86.50
	25	23.00	86.00
	29	23.00	86.00
Quadrant 3	33	23.00	86.00
	37	22.50	86.00
	41	23.00	86.00
	45	23.00	86.00
Quadrant 4	49	23.00	86.00
	53	23.50	86.00
	57	23.00	86.00
	61	23.00	86.00
Average	23.03	86.09	

IMPORTANT!
Verify correct IGV orientation as shown in the sketch below.
Orientation should always provide the "Overhang" towards the bellmouth side of the IGVs axis of rotation.
Confirm measurements have been completed by Mechanical Team.
X1/X2 Backlash/Bushings/64 Vane Angle check out @ Mech Stop block.



Correct Orientation of IGVs at Full-Open Position.

As Left Min & Max Position *

CSGV settings	Min	Max
	23	86

Post Calibration - Minimum 4 Vanes @ each position

Check Point	Measured Angle				Comparison Angle	
	Vane #	1	16	32	64	LVDY 30%
Full Closed	25	23.5	23	23	23	22.7
42.0°	42	42.5	42	42	42	41.9
58.0°	56	56	58	58	58.1	57.8
72.0°	72	72	72	72	72.2	71.8
Full Open	85	85	86	86	86.1	85.8

Comments:
Installed New IGV Vanes, Inner & outer Bushes and Gears. Made adjustment of IGV angles as per GE Specification and returned to service after assembly of upper half inlet bell mouth, X1, X2, inner Bushing clearance, Gear Backlash and Angle were checked for all vanes as well as per TIL 517-CR, TIL 1068-R3. All the measurements were found within allowable specs.

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4.17 Continuous Dynamics Monitoring

Part Description:

All CDM probes were inspected for any tip damage and were found in good condition. Loops were tested with the handheld frequency Tester.

Recommendation Status: Should be done immediately

Recommendation Type: Parts

Recommendation Description:

Site doesn't have any spare amplifiers & BAPA cards spares should be ordered for contingency.

4.18 Hydraulic and Lift Oil System

4.18.1 Hydraulic Pumps

Part Description:

Hydraulic Pumps were tested and lead/lag selection was verified from HMI screen.

4.18.2 Lift Oil Solenoid (20QB-1)

Part Description:

20qb-1 was stroked and lift pressure was adjusted as per the reset settings of 63qb-1 low pressure switch.

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4.18.3 Lift Oil Switch or Transmitter

Part Description:

Calibration checks of 63qb-1 was performed by the customer I&C team.

4.18.4 Hydraulic Oil Switch or Transmitters

Part Description:

All the hydraulic pressure switches and transmitter were checked for calibration settings by the customer I&C team.

4.19 Lube Oil System

4.19.1 Lube Oil Motors

Part Description:

AC Pumps were tested for Operation and Lead/Lag switching was tested from the HMI. DC LO pump was tested by simulating the zero speed signal, it automatically came in to service and pressure was found to be ~10PSIG at the Generator end. DC Seal Oil was tested with generator pressurized with CO2 and by switching off the AC LO and SO pumps

Currents:

- DC LO : 120A at 120V
- DC SO : 74A at 120V

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4.19.2 Lube Oil Transmitters and Switches

Part Description:

All the LO transmitters and switches were checked for calibration settings per device summary by the customer team.

4.20 Emergency Push Stop Test

Part Description:

Emergency Push button was tested to generate the Trip signal and Alarm.

2022-08-21 002232.888	2022-08-21 002325	Alarm	NO	ALERT	G1	1	Y	17002	G1L20700	High lube oil temperature sensor deviation
2022-08-21 002326.016	2022-08-21 002325	Alarm	AL	DIAG	G2	2	Y	17002	G2L000CP	Generator #12 pressure high
2022-08-21 002325.776	2022-08-21 002325	Alarm	AL	LVL_2	G2	2	Y	17002	G2L1007HA	GEN110 OAS PRES BURST HIGH
2022-08-21 002325.776	2022-08-21 002325	Alarm	AL	Netwk	G2	2	Y	17001	G2L000CH	NO ANALYZERS: MODBUS CHANNEL A IS UNHEALTHY
2022-08-21 002327.108	2022-08-21 002325	Alarm	AL	LVL_1	G1	2	Y	17002	G1L0117	TRIP - generator 12 lube oil level low
2022-08-21 002328.716	2022-08-21 002325	Alarm	AL	ALERT	G1	2	Y	17002	G1L20700	Signal Force in Converter
2022-08-21 002327.788	2022-08-21 002325	Alarm	AL	ALERT	G1	2	Y	17002	G1L2080P	Master protective stop lockout
2022-08-21 002328.048	2022-08-21 002325	Diagn	AL	Diag	G2	2	Y	17002	G2L000CP	Analog input (1 OAS) 4 unrearmy (Alarm ID: G2L000CAL0116) drop 20. Main 1 (Unit)
2022-08-21 002328.748	2022-08-21 002325	Alarm	AL	ALERT	G1	2	Y	17002	G1L2080P	Butt Monitor - lube servo driver faulted
2022-08-21 002328.748	2022-08-21 002325	Alarm	AL	DIAG	G1	2	Y	17002	G1L2080P	Wing gear valve (1) servo driver faulted
2022-08-21 002328.708	2022-08-21 002325	Diagn	AL	Diag	G1	2	Y	2000104	G1P0003	Servo current (3) disagrees w/ ref. actual (Alarm ID: G1P0003NU1-TASA, dev 20, PHS 1 (Unit))
2022-08-21 002328.708	2022-08-21 002325	Diagn	AL	Diag	G1	2	Y	2000104	G1P0003	Servo #2 feedback (Alarm ID: G1P0003NU1-TASA, dev 20, PHS 1 (Unit))
2022-08-21 002328.018	2022-08-21 002325	Alarm	AL	DIAG	G1	2	Y	17002	G1L2080P	Inter guide valve (2) servo driver faulted
2022-08-21 002328.918	2022-08-21 002325	Diagn	AL	Diag	G1	2	Y	2000104	G1P0003	Servo current (2) disagrees w/ ref. actual (Alarm ID: G1P0003NU1-TASA, dev 20, PHS 1 (Unit))
2022-08-21 002328.508	2022-08-21 002325	Diagn	AL	Diag	G1	2	Y	2000104	G1P0003	Servo #1 feedback (Alarm ID: G1P0003NU1-TASA, dev 20, PHS 1 (Unit))

Trip test

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4.21 Over Speed Test

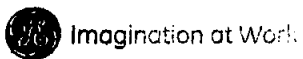
Part Description:

Overspeed Test was performed at a lower setpoint of 6% TNH. Unit was started normally and it tripped on OST protection upon reaching 6% speed, thus validating the functionality of electronic OST protection.

Recorded Time (Local Time)	Type	Alarm St.	Class	Dev.	Ack.	Primary Language	Description	Dist.	Addr ID	Second	Priority	Sound	Alarm S.	St.	Val.	Un.	La.
2022-06-22 21:55:18.181	Alarm	ALARM	DIAG	G1	Yes	Gas valve right	High/Under Pressure	Good		01	Alarm	172.18...	No	True	Se...	N...	
2022-06-22 21:55:18.145	Alarm	ALARM	DIAG	G1	Yes	Turbine compressor	High/Under Pressure	Good		01	Alarm	172.18...	No	True	Se...	N...	
2022-06-22 21:55:33.825	Alarm	NORMAL	ALERT	G1	No	High	APRO compressor	Good		01	Alarm	172.18...	No	False	Se...	N...	

OST Test

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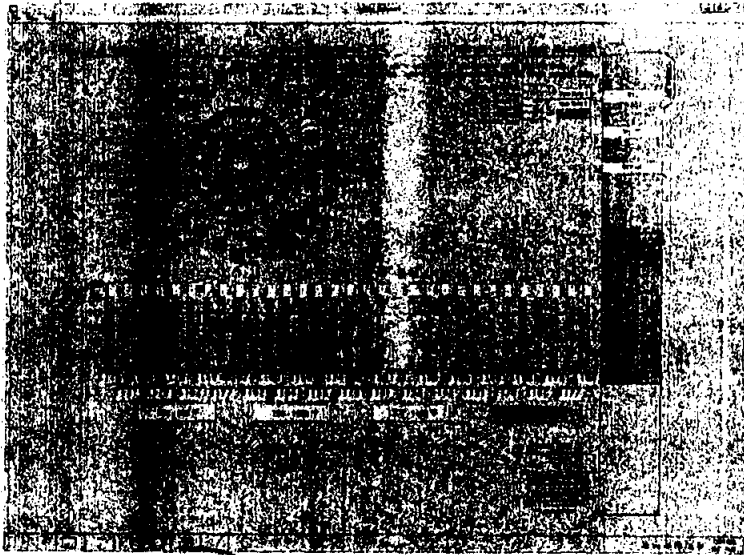
S25

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4.22 Start-up

Part Description:

Unit was put on Turning Gear after a thorough Walkdown. After 24 hours of TG operation unit was tested on Crank speed and then successfully started on Gas Fuel. Parameters were monitored throughout the operation starting from firing to base load.



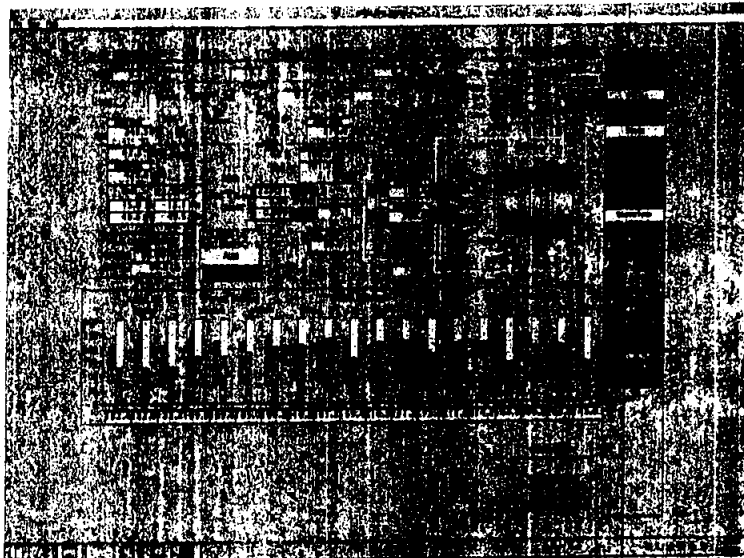
Exhaust

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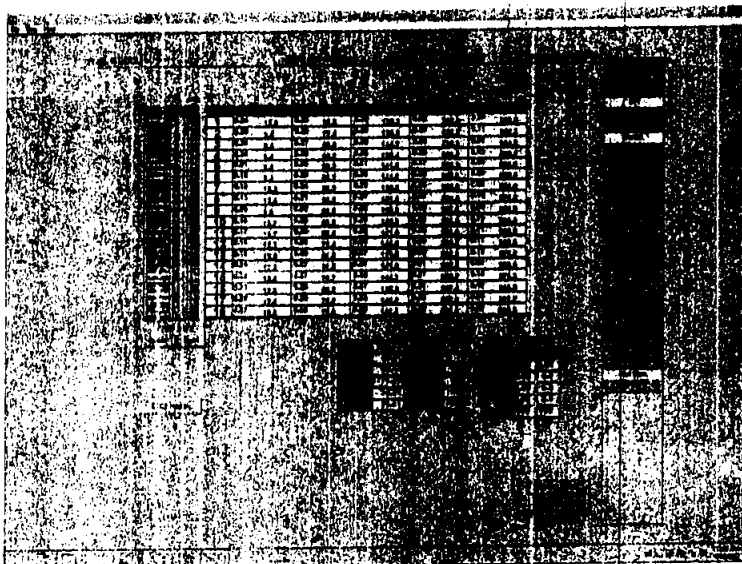
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4.22 Start-up



BRG temp



CDM

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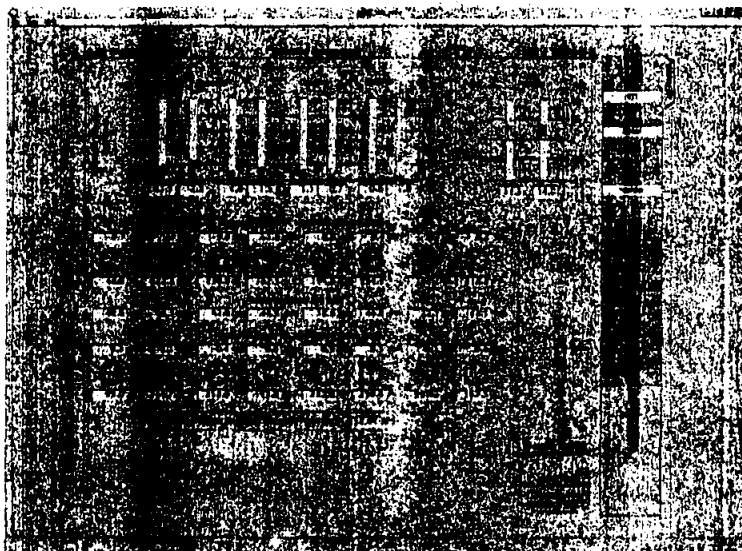
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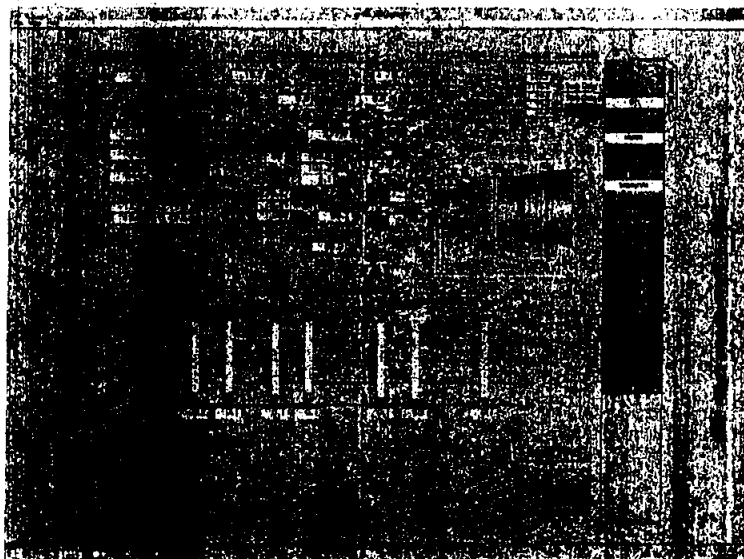
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4.22 Start-up



Proximeters



Seismic

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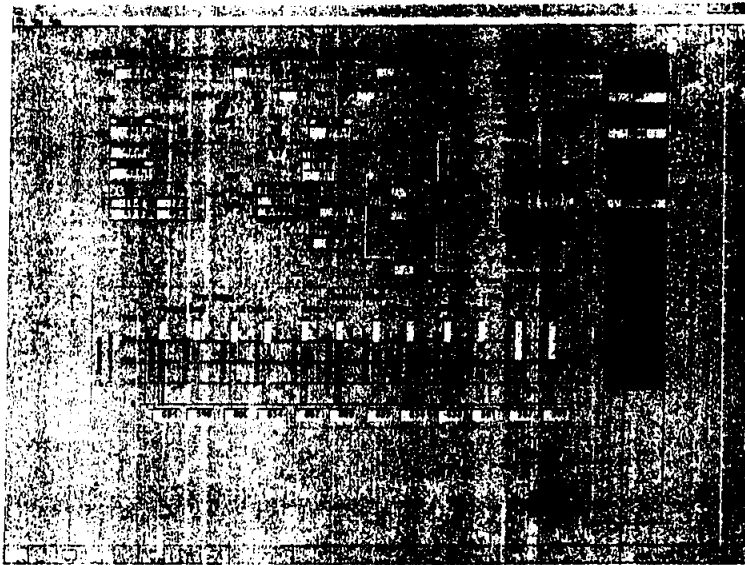
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4.22 Start-up

Component	Model	Status	Notes
1000000000	GE	OK	...
1000000001	GE	OK	...
1000000002	GE	OK	...
1000000003	GE	OK	...
1000000004	GE	OK	...
1000000005	GE	OK	...
1000000006	GE	OK	...
1000000007	GE	OK	...
1000000008	GE	OK	...
1000000009	GE	OK	...
1000000010	GE	OK	...
1000000011	GE	OK	...
1000000012	GE	OK	...
1000000013	GE	OK	...
1000000014	GE	OK	...
1000000015	GE	OK	...
1000000016	GE	OK	...
1000000017	GE	OK	...
1000000018	GE	OK	...
1000000019	GE	OK	...
1000000020	GE	OK	...

Software equality



Wheel space

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4.23 Emission Tuning

Part Description:

Unit was tuned from 100MW to baseload and mapping was performed. Engine was left in emission compliant range and Auto Tune functionality was enabled post tuning. Site team to download the constant changes in controller in the next available shutdown opportunity.

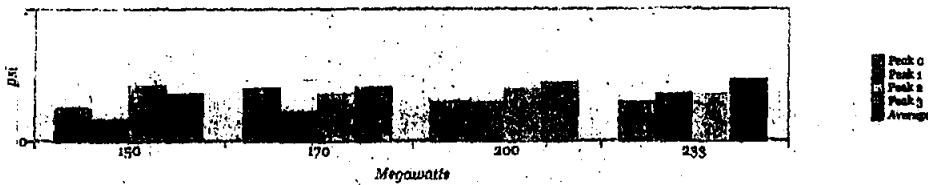
AsFound/AsLeft for Custom Constants

TAG	INDEX	VALUE	SCALE	AsFound	AsLeft
JCA_NOXTUN_AR_M63(0)	1	0.67778			0.53844
JCA_NOXTUN_AR_M63(1)	2	1			1
JCA_NOXTUN_AR_M63(2)	3	0.91389			0.82044
JCA_NOXTUN_AR_M63(3)	4	0.87701			0.5085
JCA_NOXTUN_AR_M63(4)	5	7.65901			3.13172

DLN Constant Changes

DATE/TIME	SPEED	LOAD	DLN	AS LEFT																
				Peak 0			Peak 1			Peak 2			Peak 3							
				DLN	DLN	DLN	DLN	DLN	DLN	DLN	DLN	DLN	DLN	DLN	DLN	DLN				
6/23/2022 14:52 AM	32	3	150	89.74	0.18	0.36	13	17	0.14	0.17	51	5	0.30	0.43	100	25	0.83	0.37	213	8
6/23/2022 13:07 AM	31	3	170	91.44	0.23	0.4	13	4	0.17	0.23	55	10	0.28	0.36	132	16	0.87	0.48	210	8
6/23/2022 11:49:11 AM	30	3	200	93.86	0.23	0.31	13	3	0.22	0.29	53	15	0.29	0.4	132	10	0.88	0.46	203	8
6/23/2022 8:45:34 AM	31	3	233	95.4	0.20	0.31	13	4	0.26	0.30	53	5	0.30	0.36	132	7	0.88	0.48	200	8

Average Max Can Dynamics At Various Loads



Dynamics Levels

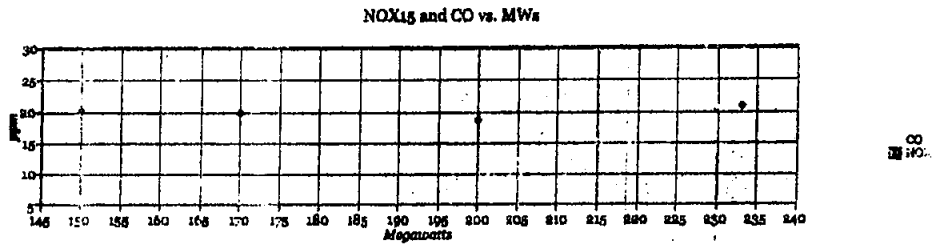
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GE Power Power Services

4.23 Emission Tuning

DATE/TIME	TEST POINT	DLN MODE	MWATT Out	CA ORT	As Left NOX _x (ppm)	CO (ppm)	EXHAUST TEMP (deg F)	EXHAUST TEMP (deg F)	EXHAUST SFEADN (deg F)	EXHAUST SFEADN (deg F)
6/26/2022 1:44:02 AM	4	3	150	99.74	80.08	5	321	1177	48	28
6/26/2022 1:50:07 AM	51	3	170	91.44	19.7	8	321	1179	41	27
6/26/2022 1:59:11 AM	50	3	500	93.86	18.47	1	300	1183	40	30
6/26/2022 2:15:24 AM	53	3	233	96.4	20.87	1	301	1170	48	36



NOx Levels

4.24 SW Backup and Trend Data

Part Description:

The as-left Software copy and Trends data are available in ER-20220704-0089 and may be used for future reference.

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Imagination at Work

LARGE CALL-OUT - 299041
 CENTRAL POWER GENERATION COMPANY LTD
 GUDDU

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GE Power Power Services

5 Quality Checkpoint (QCP)

5.1 Attachments

See content below.

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Guddu 747MW GT-14 MI_RO QCP

QCP - Quality Control Plan



Item No.	Description	Reference	Frequency	Method	Tools	Personnel	Start Date	End Date	Remarks
1	Site Preparation								
2	Site Preparation								
3	Site Preparation								
4	Site Preparation								
5	Site Preparation								
6	Site Preparation								
7	Site Preparation								
8	Site Preparation								
9	Site Preparation								
10	Site Preparation								
11	Site Preparation								
12	Site Preparation								
13	Site Preparation								
14	Site Preparation								
15	OUTAGE								
16	1010 Remove Compressor and Turbine Borecope Probs and Pins	QCP28							
17	1010 Enhanced Borecope - Pre-Inspection	QCP29							Critical Procedure
18	1010 Clean and Prepare Sradpan Body Shoes and Coupling Flange	QCP01							
19	1015 Erect External Scaffolding								
20	1011 Breaker Open								
21	1012 Turbine On Turning Gear / Cooldown								

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Guddu 747MW GT-14 MI_RO QCP

QCP - Quality Control Plan



Outline ID:		126207	Equipment SYS-ID:		QCP / ITPL Number:				QCP / ITPL Revision:				
No.	Activity ID	Task / Document Title	Inspection Record (Tabl Certificate)	Procedure GE Internal only	Clearance Book GE Internal	Insp. Type	Craft Supervisor		GE Field Engineer		SR ID	Customer (if applicable)	
							Initial	Date	Initial	Date	VER	Initial	Date
22	1013	Perform Water Wash (Customer)											
23	1014	Sign on LOTO											
24		Disassemble Enclosures / Ducts											
25	1017	Erect Internal Scaffolding											
26	1020	Disconnect wiring & conduit in turbine compartment & roof											
27	1016	Remove Roof & Panels, Fans, Ducts & Conduit											
28	1021	Wholesale TCPLs, Disconnecting and Removal		GT-1041									
29	1021	Disconnection and Removal, #1 Bearing area tubes and TCPLs		GT-1094									
30	1021	Disconnection and Removal, #2 Bearing area tubes and TCPLs		GT-1095									
31	1022	Remove Inlet Plenum, Elbow & Duct Components					MSR 8/5	MSR 8/5	8/5/22	8/5/22			
32	1016	Assemble Internal Scaffolding											
33		Disassemble Casings											
34	1030	Install Mechanical Casing Jacks		GT-1801									
35	1037	Unbolt & Remove Turbine Casing		GT-1802									Critical Procedure
36	1043	Remove Compressor Inlet Casing		GT-1802									
37	1045	Unbolt and Remove MLI 0706 Exhaust Turbine		GT-1840									
38	1039	Unbolt and Remove Compressor Casing		GT-1801									Critical Procedure
39	1030	Remove Compressor Casings Using a Multi-Casing Lift		GT-1831									Critical Procedure
40	1038	Remove Turbine Casing Manways											
41	1040	Unbolt and Remove Compressor Discharge Casing		GT-1801									
42	1041	Unbolt & Remove Turbine Bearing Housing		GT-1805			MSR 8/5	MSR 8/5	8/5/22	8/5/22			Critical Procedure
43		Disassemble Inletor & Exhaustor											

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CS CamScanner

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Guddu 747MW GT-14 MI_RO QCP



QCP - Quality Control Plan

Outage ID:		126207		Equipment SYS-ID:		QCP / ITPL Number:		QCP/ITL Revision:							
No.	Activity ID	Task / Document Title	Inspection Record (Test Certificate)	Procedure GE Internal only	Clearance Book GE Internal	Inst. Type	Craft Supervisor	GE Field Engineer	QA 77	QA 77	QA 77	QA 77	QA 77	QA 77	QA 77
<small>Note 1: Critical Path Procedures (Critical CP) and Outage Site Repair Instructions (Critical OSRI) require records and responses within these documents, which are to be archived together with the QCP / ITPL. Note 2: Only Field Engineer or Craft Supervisor that refers an activity being completed can sign the QCP / ITPL or related documents.</small>															
<small>Initial Date Initial Date Initial Date Initial Date Initial Date Initial Date Initial Date Initial Date Initial Date Initial Date Initial Date Initial Date Initial Date Initial Date</small>															
58	1063	Remove Turbine Buckets - F Class		OSR-1005			MS 14/5	Z	18/2						Critical Procedure
59	1063	First Stage Bucket PIPO, Staking	GT101												
60	1063	Buckets, 1st Stage	GT905												
61	1063	Turbine Buckets - General Condition, Shrouded Tip Buckets	GT142												Critical Procedure
62	1064	Remove Turbine Buckets - F Class		OSR-1005											Critical Procedure
63	1064	Second Stage Bucket PIPO, Staking	GT102				MS 17/5	Z	18/2						
64	1064	Buckets, 2nd Stage	GT903												
65	1064	Bucket Shroud - General Condition, 2nd Stage	GT120												
66	1064	Turbine Buckets - General Condition, Shrouded Tip Buckets	GT142												Critical Procedure
67	1065	Remove Turbine Buckets - F Class		OSR-1005											Critical Procedure
68	1065	Third Stage Buckets PIPO and Staking	GT103				MS 19/5	Z	18/2						
69	1065	Buckets, 3rd Stage	GT908												
70	1065	Bucket Shroud - General Condition, 3rd Stage	GT140												
71	1065	Turbine Buckets - General Condition, Shrouded Tip Buckets	GT142												Critical Procedure
72		Disassemble HGP Components													
73	1070	Remove 2nd Stage Nozzle Segments - Upper Half		GT-1014											
74	1070	Second Stage Nozzle Segments - Lower Half													
75	1071	Remove 3rd Stage Nozzle Segments - Upper Half		GT-1018											
76	1071	Third Stage Nozzle Segments PIPO	GT-103												
77	1074	Remove 3rd Stage Shroud Segments - Upper Half		GT-1019											
78	1074	Shroud Segments PIPO	GT-103												
79	1073	Remove 3rd Stage Shroud Segments - Lower Half		GT-1019											
80	1073	Standard & Outer Shroud Check (Second Stage) PIPO	GT-103												
81	1077	Nozzle Alignment & Radial Clearance Checks, 1st Stage	GT-1024												

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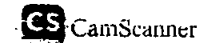
Gaddu 747MW GT-14 MI_RO QCP



QCP - Quality Control Plan

QCP ID	QCP Description	Equipment S/N	QCP / ITPL Revision	QCP / ITPL Revision	QCP / ITPL Revision	QCP / ITPL Revision
1043	Final Clearance Checks - Final Checks	GT-108				Critical Procedure Risk: Inspection tool damage inside the machine Recommendation: clear communication, remove tool prior to turning the rotor
1044	Final Clearance Checks - Final Checks	GT-108				Critical Procedure Risk: Inspection tool damage inside GT Recommendation: clear communication, remove tool prior to turning the rotor
1040	Load Gating Alignment Checks	GT-108				Critical Procedure
1046	Coupling Alignment (Load, Accessory Gear, Load Gear)	GT-1018				
1049	Tutor Station (MS7901FB, 9001FB)	GT-1041				
1051	9FA 5-Belt Thrust Bearing Clearance (Flow/Stop) Checks	GT-1020				Critical Procedure Risk: Risk of Equipment damage Recommendation: Ensure jacks are set on rigid enough structure/material
1053	Remove 9FA Bearing Cover and Joint Bearing	GT-1020				
1053	Remove Thrust Bearing	GT-1020				Critical Procedure Risk: Rotor damage Recommendation: Don't attempt to manually rotate the rotor without thrust bearing in place
1027	91 Bearing Area Clearances	GT-2022				
1051	Remove 92 Standard Cover and Bearing	GT-1021				
1024	92 Bearing Area Clearances	GT-2020				
1062	Remove 9FA/B and 9FA/B Limit Stairs	GT-1030				Critical Procedure Risk: Comp rotor and stator clash Recommendation: Verify guide pins correct part number. Maintain level while jacking up
1002	Rotor Joint Condition and Measurement	GT-1030				
1050	Remove 9FA Bearing Cover and Joint Bearing	GT-1020				

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Guddu 747MW GT-14 MI_RO QCP

QCP - Quality Control Plan



Outage ID	Equipment SYS-ID	QCP /ITPL Number	QCP /ITPL Reference
62	1008	GT-1300	
63	1009	GT-1301	
64	1010	GT-1302	
65	1011	GT-1303	
66	1012	GT-1304	
67	1013	GT-1305	
68	1014	GT-1306	
69	1015	GT-1307	
70	1016	GT-1308	
71	1017	GT-1309	
72	1018	GT-1310	
73	1019	GT-1311	
74	1020	GT-1312	
75	1021	GT-1313	
76	1022	GT-1314	
77	1023	GT-1315	
78	1024	GT-1316	
79	1025	GT-1317	
80	1026	GT-1318	
81	1027	GT-1319	
82	1028	GT-1320	
83	1029	GT-1321	
84	1030	GT-1322	
85	1031	GT-1323	
86	1032	GT-1324	
87	1033	GT-1325	
88	1034	GT-1326	
89	1035	GT-1327	
90	1036	GT-1328	
91	1037	GT-1329	
92	1038	GT-1330	
93	1039	GT-1331	
94	1040	GT-1332	
95	1041	GT-1333	
96	1042	GT-1334	
97	1043	GT-1335	
98	1044	GT-1336	
99	1045	GT-1337	
100	1046	GT-1338	
101	1047	GT-1339	
102	1048	GT-1340	
103	1049	GT-1341	
104	1050	GT-1342	
105	1051	GT-1343	

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Guddu 747MW GT-14 MI_RO QCP



QCP - Quality Control Plan

Outage ID:		12027	Equipment SYS ID:	QCP / HTPL Number:	QCP / HTPL Revision:						
No.	Activity ID	Task / Description / Title	Inspection Pointed (Year-Condition)	Procedure GE Internal only	Classroom (Book, GE Internal)	Inspection Type	Craft Supervisor	GE Field Engineer	W/F	Initial	Date
106	1085	Compressor Head/Valves/Shaft Check		PPRSE0004							
107	1085	Inspect/Repair Hubs (FRM) (T.L.S Procedures)									
108	1082	DLM-2, DLM-23 - Verify Pits Dimensions	GT103								
109	1083	Chambers - General Condition	GT3010								
110	1083	Crossin Tube and Retainer	GT3680								
111	1083	Flow Stems - General Inspection	GT3020								
112	1083	Linear Cap Assembly (DLM-2.6)	GT3111								
113	1083	Linear Detector	GT3118								
114	1083	Linear Detector (DLM-2)	GT3120								
115	1083	Linear - General Condition	GT3185								
116	1083	Linear - General Condition (DLM-2)	GT3160								
117	1083	Transition Piece - General Condition (Frame 9E, 9F)	GT3205								
118	1083	Transition Piece Front Support Clamp - General Condition (Frame 7F, 9F)	GT3215								
119	1083	Chambers - General Condition	GT3340								
120	1083	Combustion - Auxiliary Assembly 021	GT3327								
121		Clean & Inspect HGP Combs									
122	1080	Disassemble 3, 4, 5, 6, 7 Stage									
123	1088	Nozzle - General Condition (3, 4, 5, 6, 7, 8, 9, 9F)	GT3430								
124		Clean & Inspect Rotor & Bearings									
125	1092	Load Coupler	GT3020								
126	1095	#1 Bearing - Check Clearance	GT3010								
127	1095	Journal Bearing Clearance	GT3010								
128	1095	Oil Drain - Check Alignment	GT3010								
129	1095	#2 Bearing - Check Clearance	GT3010								

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Guddu 747MW GT-14 MI_RO QCP

QCP - Quality Control Plan



Output ID	Equipment Site ID	QCP / ITPL Revision	QCP / ITPL Revision	QCP / ITPL Revision	QCP / ITPL Revision	QCP / ITPL Revision	QCP / ITPL Revision	QCP / ITPL Revision	QCP / ITPL Revision	QCP / ITPL Revision	
Task ID	Task Description	Equipment ID	Frequency	Units	Start	End	W / F	Start	End	Date	Notes
126	Oil Distention Alignment	GT2122									
127	Check Bearing - Critical Condition	GT2140						26/5		26/02	
128	Clean & Inspect Rotor (at site)							3/1		3/6/20	
129	Check & Inspect Turbine Wheels										Risk: Damage to dovetail due to use of grinder Recommendation: Use only hand cleaning or other suitable method
130	Check & Inspect Compressor Blade Inspect	GT3889									
131	Clean & Inspect Casings										
132	Clean & Inspect Inlet Casing (Ballmount)							30/5		30/5	
133	GT-3889 Replace IMV Motor in or out	GT-3889						28/5		28/5	Critical Procedure
134	IGV Inspection - Mechanical - As Found	GT4921									Risk: Compressor degradation Recommendation: Complete as found (mechanical checks of all 84 blades with full open and closed positions)
135	Check IGV Stops & Actuator (As required i.e. IGV Blades, Gears removed)	GT4921									
140	Adjust IGV Stops & Actuator (As required i.e. IGV Blades, Gears removed)	GT3889									Risk: Compressor degradation Recommendation: Complete as found (mechanical checks of all 84 blades with full open and closed positions) Note: If as found measurements are within tolerance and IGV motor ball moult are not removed, ball tank is not required
141	IGV Inspection - Mechanical - As Left	GT4921									
142	IGV Spring and Calibration - Controls	CC3719									Risk: Compressor degradation Recommendation: Conduct calibration of 18 blades distributed 4 measurements in each quadrant
143	Disconnect and Remove IGV Actuator Connecting Link	GT3889									Critical Procedure
144	Replace IGV Spring Washers	GT3889						24/5		28/5	

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Guddu 747MW GT-14 MI_RO QCP

QCP - Quality Control Plan



Outage ID:		12607	Equipment S/Ns-40:	QCP / ITPL Number:	QCP / ITPL Revision:									
No.	Activity ID	Task / Description / TID	Inspection Record (Test Certificate)	Procedure GE internal only	Clearance Book GE internal	Step Type	Cost Supervisor	GE Field Engineer	QA #	Customer (if applicable)	Remarks			
							Initial	Date	Initial	Date	W/H	Initial	Date	
145	1108	Inspect and Connect IGV Actuator Connecting Link		GT-2629			M/S 20/6	J 20/6						Critical Procedure
146	1108	Inspect Guide Vane Clearance, Variable	GT-2629				M/S 20/6	J 20/6						
147	1102	Compressor Rub Record	GT-2626											
148	1107	Clean & Inspect Exhaust Frame Casing					M/S 10-6	M/R 10-6						
149	1103	Clean & Inspect CDC Casing					M/S 10-6	M/R 10-6						
150	1104	Clean & Inspect Inlet Barrel L/N					M/S 10-6	M/R 10-6						
151	1109	Sator Drop Checks	GT-2629				M/S 1/6	J 1/6						For Emerging Scope as applicable Risk: Reverse Installation Recommendation: Pre task brief and peer checks
152	1101	Wheelpace Thermostats	GT-2629				M/S 18/5	J 18/5						
152	1101	Turbine Casing Rub mapping	GT-2621											
154		Clean & Inspect Enclosures & Thuds												
152	1113	Wheelpace TCPLs, Clean and Inspect		GT-2621			M/S 19/5	J 19/5						
156	1113	Flame Detectors and Spark Plugs, Clean and Inspect		GT-2602			M/S 18/5	J 18/5						
157	1113	Flame Detector Functional Check		EMRC EP2602										
158	1113	Spark Plugs Functional Check		EMRC EP2603										
159	1113	Spark Plugs and Gas Straps		EMRC EP2603										
159	1113	Clean and Inspect #1 bearing housing and TCPLs		EMRC EP2604			M/S 18/5	J 18/5						
159	1113	Clean and Inspect #2 bearing housing and TCPLs		EMRC EP2604			M/S 19/5	J 19/5						
162	1114	Clean & Inspect Fuel & Exhaust Pipes					M/S 18/6	J 18/6						
162	1114	Clean & Inspect Inlet Plenum Exhaust & Dust Collectors					M/S 14/6	J 14/6						

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Guddu 747MW GT-14 MI_RO QCP

QCP - Quality Control Plan

Change ID	1222	Equipment S/N - ID	QCP / ITPL Res. Loc.	QCP / ITPL Res. Loc.		Critical Procedure
				Initial	Date	
167	1117	Install 1st Stage Shroud Segments - Lower Half	GT-311	2/15	2/15/22	
168	1117	Install 1st Stage Shroud Segments - Upper Half	GT-311	2/15	2/15/22	
169	1124	Install 2nd Stage Shroud Segments - Upper Half	GT-312	2/15	2/15/22	
170	1124	Install 2nd Stage Shroud Segments - Lower Half	GT-312	2/15	2/15/22	
171	1118	Install 3rd Stage Shroud Segments - Upper Half	GT-313	2/15	2/15/22	
172	1118	Install 3rd Stage Shroud Segments - Lower Half	GT-313	2/15	2/15/22	
173	1125	Install 1st Stage Nozzle Segments - Upper Half	GT-314	2/15	2/15/22	
174	1125	Install 1st Stage Nozzle Segments - Lower Half	GT-314	2/15	2/15/22	
175	1129	Install 2nd Stage Nozzle Segments - Upper Half	GT-315	2/15	2/15/22	
176	1129	Install 2nd Stage Nozzle Segments - Lower Half	GT-315	2/15	2/15/22	
177	1127	Install 3rd Stage Nozzle Segments - Upper Half	GT-316	2/15	2/15/22	
178	1127	Install 3rd Stage Nozzle Segments - Lower Half	GT-316	2/15	2/15/22	
179	1121	Install 1st Stage Nozzle Segments - Upper Half	GT-317	2/15	2/15/22	
180	1121	Install 1st Stage Nozzle Segments - Lower Half	GT-317	2/15	2/15/22	
181	1121	Install 2nd Stage Nozzle Segments - Upper Half	GT-318	2/15	2/15/22	
182	1121	Install 2nd Stage Nozzle Segments - Lower Half	GT-318	2/15	2/15/22	
183	1128	Install 3rd Stage Nozzle Segments - Upper Half	GT-319	2/15	2/15/22	
184	1128	Install 3rd Stage Nozzle Segments - Lower Half	GT-319	2/15	2/15/22	
185	1128	Install 1st Stage Nozzle Segments - Upper Half	GT-320	2/15	2/15/22	
186	1128	Install 1st Stage Nozzle Segments - Lower Half	GT-320	2/15	2/15/22	
187	1128	Install 2nd Stage Nozzle Segments - Upper Half	GT-321	2/15	2/15/22	
188	1128	Install 2nd Stage Nozzle Segments - Lower Half	GT-321	2/15	2/15/22	
189	1122	Install 1st Stage Nozzle Assembly - Lower Half	GT-322	2/15	2/15/22	Critical Procedure
190	1122	Install 1st Stage Nozzle Assembly - Upper Half	GT-322	2/15	2/15/22	

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Guddu 747MW GT-14 MI_RO QCP



QCP - Quality Control Plan

Outage ID: 126207		Equipment-SYS-ID:		QCP /ITPL Number:				QCP /ITPL Revision:			
No.	Activity ID / Task / Document Title	Inspection Method (Test Category)	Procedure (GE internal only)	Classroom Book, GE internal	Task Type	Start Date	End Date	Start Date	End Date	W/H	Notes
101	1122 Upgrade Segment PISO	GT-1111									
102	1128 Install 1st Stage Nozzle Support Ring - Upper Half		GT-3307			3/6	3/6	MR	3/6		
103	1128 Install 1st Stage Nozzle Support Ring - Lower Half		GT-3308			3/6	3/6		3/6		
104	1129 Install 1st Stage Nozzle Assembly - Upper Half		GT-3308			3/6	3/6		3/6		
105	1129 First Stage Nozzle Segments PISO	GT-1107									
106	1129 Nozzle Segments PISO	GT-1111									
107	1130 Stage #1 Nozzle Concentricity Checks		GT-3309			3/6	3/6		3/6		Critical Procedure
108	1130 Nozzle, Ellipticity & Radial Concentricity Check, 1st Stage	GT-2045				3/15	3/15		3/15		
109	1130 Reassemble Rotor & Bearings										
200	1139 Install #1 Bearing and #1 Bearing Casing Cap		GT-3020			10/6	10/6		10/6		Task: Foreign material left inside. Recommendation: verify for any left foreign material prior to bus up. Count tags in and out of the FME zone.
201	1139 Installation and Reconnection, #1 Bearing area Probes and TDPLs		GT-3004			25/5	25/5		25/5		
202	1136 #1 Bearing Area Clearances	GT-2045				9/6	9/6		9/6		
203	1136 Oil Defectors Alignment	GT-2045									
204	1137 Install #2 Bearing and Standard Cells		GT-3021			10/6	10/6		10/6		Critical Procedure
205	1137 #2 Bearing Area Clearances		GT-2045			9/6	9/6		9/6		
206	1137 #2 Bearing Area Clearances					9/6	9/6		9/6		
207	1137 Oil Defector Alignment	GT-2045									
208	1137 Install Turbine Seal PISO		GT-3006			10/6	10/6		10/6		Critical Procedure Risk: Incorrect use of lockers. Recommendation: use proper lockers. Risk: Incorrect use of lockers. Recommendation: use proper lockers. Risk: Incorrect use of lockers. Recommendation: use proper lockers.
209	1138 Install Turbine Seal PISO					10/6	10/6		10/6		
210	1139 Install Turbine Seal PISO		GT-3006			10/6	10/6		10/6		



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Guddu 747MW GT-14 MI_RO QCP

QCP - Quality Control Plan

Outage ID		Equipment SYS-Id	QCP / ITP / Rev-Id	QCP / ITP / Rev-Id	QCP / ITP / Rev-Id		QCP / ITP / Rev-Id		Remarks
Job No.	Task								
270	270	Second Stage Bucket FAFO, Staking	GT102						
271	271	Install Turbine Buckets - F Class	OSR-1202						Critical Procedure
272	272	Third Stage Bucket PWFO and Staking	GT103						
273	273	Install E2 Bearing - FAFB and SF-FB	GT104						Critical Procedure
274	274	Install E2 Bearing and #1 Bearing Coupling	GT-105						
275	275	Install Thrust Bearing - BFA and BFB	GT-106						Critical Procedure
276	276	Install E2 Bearing and Standard Cover	GT-107						Critical Procedure
277	277	Perform Thrust Check & Calculate Set "A" Position							
278	278	Assemble Lead Coupling Flange to Generator or Compressor Rotor Coupling Flange	GT-108						Critical Procedure
279	279	Coupling Alignment (Lead, Accessory Gear, Lead Gear)	GT109						
280	280	Rotor Position (MS700FB, 8001FB)	GT1041						
281	281	Rotor Position Clearance Checks - 8 Point Checks	GT-1809		22/6		22/6		Critical Procedure Risk: inspection tool damage inside the machine Recommendation: clear communication, remove tool prior to turning the rotor
282	282	Rotor Position Clearance Checks - 8 Point Checks (FB)	GT-1814						Critical Procedure Risk: inspection tool damage inside GT Recommendation: clear communication, remove tool prior to turning the rotor
283	283	Reassemble Casing							
284	284	Verify Turbine Clearances - Opening or Closing	GT-1304		10/6		10/6		Critical Procedure
285	285	Record Opening or Closing Compressor Clearances	GT-1608		10/6		10/6		Critical Procedure Risk: dropping parts of the measurement tools inside the machine Recommendation: inspect integrity of measurement tool prior to use Use tools to the limit
286	286	Rotor Position (Frame 51, 9F)	GT1025						

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Guddu 747MW GT-14 MI_RO QCP

QCP - Quality Control Plan

Outage ID:	126207	Equipment EYE-ID:	QCP (ITPL) Number:	QCP (ITPL) Review:							
No.	Activity ID	Task Description	Inspector Record (First Initials)	Clearance Book (Internal)	Resp. Type	Start Date	End Date	W/H	Inspector	Reviewer	Notes
228	1150	Alignment - Rotor Position (77 01, 77A 01-04, SP 77-01A, 01-02)	GI-0208			10/6	10/6				
229	1150	Rotor Clearances	GI-0210								
230	1150	Rotor Clearances	GI-0211								
231	1150	Rotor Clearances	GI-0212								
232	1150	Turbine Rotor Clearances (Frame 77, 77A, 07, 07A)	GI-0213			10/6	10/6				
233	1155	Install Inner Jet - Upper Half	GI-0214			10/6	10/6				
234	1154	Install and Bolt Compressor Discharge Casing	GI-0215			10/6	10/6				
235	1156	Install Exhaust Frame Casing and Bolts				11/6	11/6				
236	1153	Install and Bolt Mid Compressor Casing	GI-0216			11-6	11-6				Critical Procedure
237	1153	Install Compressor Casings Using a Lifting Casing Lift	GI-0217			N/A	N/A				Critical Procedure
238	1157	Install and Bolt Compressor Vane Casings	GI-0218			11-6	11-6				
239	1151	Install & Bolt Turbine Casing	GI-0219			11-6	11-6				Critical Procedure
240	1152	Install Turbine Casing Manways				11/6	11/6				
241	1150	Remove Turbine Compressor Casing Bolts	GI-0220			11/6	11/6				
242		Reassemble Combustion System & Piping									
243	1152	Flame Detectors and Spark Plugs, Recast and Commission	GI-0221								
244	1152	Install Air Distribution Casing & Turbine Discharge Tube	GI-0222			11/6	11/6				
245	1152	Install Transition Pieces	GI-0223			11/6	11/6				
246	1152	Transition Piece Installation QC Record	GI-0224			12-6	12-6				
247	1152	Transition Piece to Nozzle Setback	GI-0225			12-6	12-6				
248	1152	Commission Transition Piece	GI-0226			12-6	12-6				

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Guddu 747MW GT-14 MI_RO QCP

QCP - Quality Control Plan

Order #	Equipment P/N	QCP / ITP / Revision	QCP / ITP / Revision	QCP / ITP / Revision	
249	1163	Install Combustion Liner & Inner Crosser Tubes	GT-3192	SP 11/6 11/6	Critical Procedure Risk: The Inner Crosser Fire Tubes (to be not engaged properly) RECOMMENDATION: Peer checking of correct installation of Inner Crosser Fire Tubes and Retainer position in the slots
251	1163	Install Fuel Strainer	GT-3192	SP 11/6 11/6	
252	1163	Combustion Liner FWD	GT-3191	SP 2/6 2/6	
253	1163	Combustion - Liner Cap P/PO	GT-3192	SP 20/5 20/5	Critical Procedure
253	1163	Fire Straps P/PO	GT-3193		
254	1163	Install Forward Combustion Casing Assembly	GT-3194	MR 14/6 14/6	Critical Procedure
255	1164	Install Liner Cap on Forward Combustion Casing	GT-3194	SP 21/5 21/5	
256	1164	Install Fuel Nozzle End Cover to the Forward Combustion Casing	GT-3195	SP 27/5 27/5	Critical Procedure Risk: Fuel nozzle leak Recommendation: Verify tightness of fuel nozzle distribution valves tubing connection
257	1164	Forward Cap Assembly Installation Record	GT-3195	SP 28/5 28/5	
258	1164	Combustion End Cover / Fuel Nozzle P/PO	GT-3195	SP 29/5 29/5	
259	1165	Piping & Tubing, Applied Practices	GT-3198		Critical Procedure
260	1165	Install Turbine Casing Piping	GT-3199	MR 15/6 15/6	
261	1167	Piping & Tubing, Applied Practices	GT-3199		Critical Procedure
262	1167	Install Combustion Piping (CI) - Gas Fuel, Purge, Cooling Water & False Start Drains	GT-3191	MR 17/6 17/6	Critical Procedure
263	1167	Install Combustion End Cover Piping - Liquid Fuel System, Atomizing Air, Water Injection, Steam Injection, Lig Fuel and WI Purge, etc	GT-3192	MR 21/6 21/6	Critical Procedure Risk: strainer missing/failure, allowing contamination reaching the SWV Recommendation: Verify Strainer correct installation
264	1167	Liquid Fuel Water Injection Inspection Form	GT-3200		Critical Procedure
265		Reassemblable Enclosures / Ducts			

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Guddu 747MW GT-14 MI_RO QCP

QCP - Quality Control Plan



Outage ID:		12307	Equipment: GT-14		QCP / IPL Number:		QCP / IPL Revision:	
No.	Activity ID	Task / Description / Job	Inspection Record (Test Certificate)	Procedure GE Internal only	Clearance Book GE Internal	Start Date	End Date	W / F
265	1173	Install Inlet Pans, Elbow & Duct Components				19/6	19/6	
267	1172	Check Health Monitoring Sensor - Reassembly		GT-3025				
268	1172	Speed Package & #1 Bearing Selsolc Probs, Assembly and Connection		GT-3033		15/6	15/6	
269	1172	Wholesale TCPLs Assembly and Connection		GT-3041		16/6	16/6	
270	1172	Installation and Reconnection, #1 Bearing area probes and TCPLs		GT-3024		16/6	16/6	
271	1172	Installation and Reconnection, #2 Bearing area probes and TCPLs		GT-3024		16/6	16/6	
272	1178	Adjust Internal Scaffolding				20/6	20/6	
273	1170	Install Roof & Panels, Fans, Ducts & Conduit				20/6	20/6	
274	1175	Close HRSQ Access Walkway & Reconnect #2 Bearing Turbine Hump				22/6	22/6	
275	1171	Connect Wiring & Conduits in Turbine Compartment & Roof				21/6	21/6	
276	1170	Remove Internal Scaffolding				22/6	22/6	
277		DEMOLITION / MOVE OFF SITE						
278		Completion of Work Scope verified with Customer				22/6	22/6	
279		FME setup recommissioned, FME records printed				19/6	19/6	
280		Customer Start-up Readiness Meeting conducted (attendance sheet attached)				22/6	22/6	
281		Outage EHC setup decommissioned				19/6	19/6	
282		Performance test complete						
283		Overall condition of Site & Equipment reviewed with Customer						
284		Rented material returned				23/6	23/6	
285		Tooling returned, inventory of tools checked				23/6	23/6	
286		Customer Event Meeting conducted						
287		Outage EHC setup decommissioned						

Critical Procedure
Verify Tightness of TCPLs and Joints according to wiring diagram
Verify Tightness of TCPLs and Joints according to wiring diagram
Verify Tightness of TCPLs and Joints according to wiring diagram

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Guddu 747MW GT-14 MI_RO QCP



QCP - Quality Control Plan

Outage ID:	Equipment C/S:	QCP / ITPL Revision:	QCP / ITPL Revision:																
<table border="1"> <thead> <tr> <th>Author</th> <th>Date</th> <th>Initials</th> <th>Signature</th> </tr> </thead> <tbody> <tr> <td>Zameer JALALI</td> <td></td> <td>Z</td> <td></td> </tr> <tr> <td>Mostafa Kamal</td> <td></td> <td>M.K</td> <td></td> </tr> <tr> <td>S.M. Mahmood</td> <td></td> <td>S.M.</td> <td></td> </tr> </tbody> </table>				Author	Date	Initials	Signature	Zameer JALALI		Z		Mostafa Kamal		M.K		S.M. Mahmood		S.M.	
Author	Date	Initials	Signature																
Zameer JALALI		Z																	
Mostafa Kamal		M.K																	
S.M. Mahmood		S.M.																	

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Guddu 747MW GT-14 MI_RO QCP

QCP - Quality Control Plan



Outage ID:		126207	Equipment SYS-ID:		QCP / ITPL Number:				QCP / ITPL Revision:				
No.	Activity ID	Task / Document Title	Inspection Record (Full Certificates)	Procedure GE internal only	Clearance Book (GE internal)	Issue type	Craft Supervisor:		GE P-11 Engineer:		QA (T)	Customer (if applicable)	
							Initial	Date	Initial	Date	WFH	Initial	Date
		ADDITIONAL POINTS ADDED AFTER SECURITY ASSESS											
		New-IGV's Installation					[Signature]	29/5	[Signature]	29/5			
		Drilling of IGV's					[Signature]	18/6	[Signature]	18/6			
		Audiences pre start up checks for A3 Pump/Motors					[Signature]	22/6	[Signature]	22/6			
		GRN Preparations					[Signature]	22/6	[Signature]	22/6			

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Guddu 747MW GT-14 Controls QCP



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Craft Supervisor can sign off a control point as pre-determined during outage planning
 If that witness an activity being completed can sign the Quality Control Plan
 For more information on inspection methods and see definitions

Customer : Guddu 747

Site :

Turbine Type :

9FA-04

Turbine Serial Number :

299041

Craft Site Lead :

P. I. C. N. T. O. B. A. I.

Craft Supervisor :

QCP Revision :

OutageID :

PGS Quality Control Plans

Quality Control Point			Craft Supervisor		GE Field Engineer		Customer (if applicable)		Reference documents	Comments
Task	Verification Method	Completion %	Initial	Date	Initial	Date	Initial	Date		
Check operational Process Alarms & Diagnostic Alarms	Document Review	100			Sh	13/06				Check list active alarms from before unit stop. review
Check Data from Baseload operation	Document Review	100			Sh	13/06				Review data from Base, either Historian, DCS or base trend - speed, power, temp levels, part data
Obtain Software Log Template, Review Latest Changes and Record	Document Review	100			Sh	13/06				Review modifications done to the unit, document as you change
Check Operational Problems and Issues Log	Document Review	100			Sh	13/06				Check Customer Hot List, Issues Log
Perform Back-up Of System Software (Toolbox) & Screens	Document Review	100			Sh	13/06				Speedtronic software + HMI project, screens
Verify OSM connection to Atlanta	Visual Inspection	100			Sh	23/06				Verify with M&D team
Inspect Control Cabinets (cleanliness, voltage split, diagnostics)	Visual Inspection	100			Sh	17/06		18-06	GEH-8421	Check for correct split and if grounds are present & fix
Emergency Push Buttons Test	Visual Inspection	100			Sh	17/06		18-06		Check proper NC operation, tripping

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Guddu 747MW GT-14 Controls QCP

Quality Control Point			Craft Supervisor		GE Field Engineer		Customer (if applicable)		Reference documents	Comments
Task	Verification Method	Sample Size	Initial	Date	Initial	Date	Initial	Date		
Haz Gas Detectors Check & Calibration	Visual Inspection	100						22-06-06	MLI 474	# in GE scope
Control Devices Visual Inspection	Visual Inspection	100				21/06			MLI 0415	Check for visual damage, cracks, loose wiring, wear & tear
Performance Monitoring Visual Inspection	Visual Inspection	100							MLI 0482	Check for visual damage, cracks, loose wiring, wear & tear, transmitters correct connections
Lube Oil System Function Check	Verify measurement	100				20/06			MLI 415	Refer to OEM manual, check oil filters, levels, pressures, DC operation simulation, Mist Eliminator operation
Hydraulic Oil System Function Check	Verify measurement	100				22/06		22/06	MLI 434	Refer to OEM manual, check oil filters, levels, pressures, refill accumulator if necessary, check filters, verify LTR
Trip Oil System Function Check	Verify measurement	100				22/06			MLI 418	Refer to OEM manual, check for tripping of all valves
Turbine Exhaust Blowers 88TK-1,2 Function check	Verify measurement	100				21/06		22/06	MLI 436	Refer to OEM manual, changeover, pressure
Gas Compartment Fans 88VL-1,2 Function check	Verify measurement	100				21/06			MLI 437	Refer to OEM manual, changeover, pressure
Load compartment Fans 88V3-1,2 Function check	Verify measurement	100				21/06			MLI 438	Refer to OEM manual, changeover, pressure
Turbine Compartment Fans 88V1-1,2 Function check	Verify measurement	100				21/06			MLI 439	Refer to OEM manual, changeover, pressure
Turbine Compartment Fans 88V2-1,2 Function check	Verify measurement	100				22/06		22-06	MLI 440	Refer to OEM manual, changeover, pressure
Compressor Wash Function Check	Verify measurement	100				23/06			MLI 442	Refer to OEM manual, stroke VA17, correct position of False Start Drain

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Guudu 747MW GT-14 Controls QCP

Quality Control Point		Sample Size	Craft Supervisor		CE/TLd Engineer		Customer (if applicable)		Reference documents	Comments
			Initial	Date	Initial	Date	Initial	Date		
Control Air System Function Check	Verify measurement	100			Jhi	22/06			MLJ 415	Refer to OEM manual, CD Transmitters check, MF 5" # ETM unit
Control Air System Function Check	Verify measurement	100			Jhi	20/06			MLJ 415	Refer to OEM manual
Interlock Door Function Check	Verify measurement	100			Jhi	17/06			MLJ 427	Refer to OEM manual, check correct operation, movement and limit switch
Interlock Door Function Check	Verify measurement	100			Jhi	17/06			MLJ 471	Refer to OEM manual, danger doors limit switches
Cooling Water System Function Check	Verify measurement	100							MLJ 428	Refer to OEM manual, make sure that FO are cooled, V032 and 90LT operation
Fuel Purge Valves Function check	Verify measurement	100			Jhi	21/06			MLJ 477	Refer to OEM manual, check fittings, operation of limit switches, motion
Compressor Bypass Valves Function Check	Verify measurement	100			Jhi	17/06			MLJ 417	Refer to OEM manual, check fittings, operation of limit switches, motion
SSOV Function Check	Verify measurement	100			Jhi	17/06			MLJ 422	Refer to OEM manual, check operation/limit switches
Fire Protection System Function Check	Verify measurement	100			Jhi	20/06			MLJ 0426	Refer to OEM manual, reconcile alarms, check weighting if bottles
Tuning Gear Function Check	Verify measurement	100			Jhi	22/06			MLJ 0421	Refer to OEM manual, Cooldown function check, tube oil flow check
Calibrations:										
Perform calibration of the SRV	Verify measurement	100			Jhi	22/06			MLJ A010	Complete TA to complete calibration form

(SRV)

Guddu 747MW GT-14 Controls QCP

Quality Control Point			Craft Supervisor		GE Field Engineer		Customer (if applicable)		Reference documents	Comments
Task	Verification Method	Sample Size	Initial	Date	Initial	Date	Initial	Date		
Perform calibration of the GCVs	Verify measurement	100			Ali	22/06			ALI AD10	Controls TA to complete calibration form
Perform calibration of the IBH	Verify measurement	100			Ali	12/06			ALI AD10	Controls TA to complete calibration form
Perform calibration of the IGVs and measure angles of 64 Vanes	Verify measurement	100			Ali	24/06			ALI AD10	Controls TA to complete calibration form
Test Flame Detectors 28FDs	Verify measurement	100			Ali	17/06			GT 1032, 2052, 2001	Visual verification of installation, AFR reading with UV source
Test Spark Plugs 95SPs	Visual Inspection	100			Ali	18/06			GT 3902	Visual verification, check for proper spark
Test Fire Detectors (Turbine) <i>Complete</i>	Visual Inspection	100			Ali	20/06				Visual verification
Install & Test CDM probes with CDM tester	Verify measurement	100			Ali	18/06			GT 116147	Check proper Fren. Pumps
Test Exhaust Thermocouples (haul gun check/air spray check)	Verify measurement	100			Ali	17/06				Visual verification of installation
Test Bearing Instrumentation	Verify measurement	100			Ali	17/06				Visual verification of installation
Set Gap Voltage for Vibration & Keyphasor and Test Seismic sensors	Verify measurement	100			Ali	17/06				Visual verification of installation

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Gulddu 747MW GT-14 Controls QCP

Quality Control Point	Weighting	Craft Supervisor		GE Field Engineer		Customer (if applicable)		Reference documents	Comments
		Initial	Date	Initial	Date	Initial	Date		
Verify gap axial sensors to the correct voltage in mid position	100							MLI A010 MU 414	Gap axial sensors to the correct voltage in mid position
Go speed probes 77HT & 77HF	100							MLI 414 GT 3033	Verify proper gap setting acc. per Device Summary, correct TMR speed, 0 at stop
Check 740v/745v List	100								Compare with pre-outage data, clear alarms
Check HIGSTOP communication & health	100								Verify communication/WorkST Components
Speedbook Software Controlling & Log of	100							GEH-8788X	Ensure software is equal, build/download errors flagged, components healthy
Check For Temporary Jumpers & Forces and remove them	100								
Open PAC Case for Any Signals Still Forced	100								For any signals that are not pre-outage/customer forces
Unforce All Calibration Signals	100							MLI A010	
Pre-start Unit Walkdown	100								Verify that unit can be returned to service, TG latch long enough, door closed, systems in operation, unit ready to
Crank	100								Check TG, Speed sensors, correct operation of instrumentation
Perform Water-Wash (if in scope)	100								Refer to OEM Manual

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Guddu 747MW GT-14 Controls QCP

Quality Control Point		Sample Size	Craft Supervisor		GE Field Engineer		Customer (if applicable)		Reference documents	Comments
Task	Verification Method		Initial	Date	Initial	Date	Initial	Date		
False fire	Verify measurement	100								Check P2 and valves operation, record trend, check if (20vtx sen)
FSNL (Start-up Trend)	Verify measurement	100			Ali	24/06				Record start up trend, check vibration, combustion dynamics, vibration
Overspeed test	Verify measurement	100			Ali	24/06			MLI A010 GEH-6421 GEK111573	Perform at FSNL or Crank, as agreed, check correct overspeed sequence, record trend
DLN Tuning	Verify measurement	100			Ali	24/06				Request and follow DLN Tuning guide
Base Load Data Verification	Verify measurement	100			Ali	25/06				Compare pre and post outage data, vibration, temp, pressure, spread
Contr Constants Saved to Permanent Memory	Visual Inspection	100							GEH-6700X	Reconcile constants to perm memory
Applicable										

SSS

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6 PIPO

6.1 Combustion

CAP ASSY

Parts In			Parts Out		
Location	Serial No	Part No	Location	Serial No	Part No
SET	CAP ASSY-9FA	109T7009G0001	SET	CAP ASSY 9FA	109T7009G0001
1	17-08-1719	109T7009G0001	1	17-08-001	109T7009G0001
2	17-08-1721	109T7009G0001	2	17-08-003	109T7009G0001
3	17-08-1723	109T7009G0001	3	17-08-004	109T7009G0001
4	17-08-1724	109T7009G0001	4	17-08-005	109T7009G0001
5	17-08-1725	109T7009G0001	5	17-08-006	109T7009G0001
6	17-08-1726	109T7009G0001	6	17-08-007	109T7009G0001
7	17-08-1727	109T7009G0001	7	17-08-008	109T7009G0001
8	17-08-1728	109T7009G0001	8	17-08-009	109T7009G0001
9	17-08-1729	109T7009G0001	9	17-08-010	109T7009G0001
10	17-08-1730	109T7009G0001	10	17-08-011	109T7009G0001
11	17-08-1731	109T7009G0001	11	17-08-012	109T7009G0001
12	17-08-1732	109T7009G0001	12	17-08-013	109T7009G0001
13	17-08-1733	109T7009G0001	13	17-08-014	109T7009G0001
14	17-08-1734	109T7009G0001	14	17-08-015	109T7009G0001
15	17-08-1735	109T7009G0001	15	17-08-016	109T7009G0001
16	17-08-1736	109T7009G0001	16	17-08-017	109T7009G0001
17	17-08-1738	109T7009G0001	17	17-08-018	109T7009G0001
18	17-08-1740	109T7009G0001	18	17-08-019	109T7009G0001

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6.1 Combustion

FN ASSY

Parts In			Parts Out		
Location	Serial No	Part No	Location	Serial No	Part No
SET	FN ASSY 9FA	103T9563G0007	SET	FN ASSY 9FA	103T9563G0007
1	1304G06R1	103T9563G0007	1	1304G014	103T9563G0007
2	41304G02	103T9563G0007	2	41304G07	103T9563G0007
3	1304G11	103T9563G0007	3	1304G05	103T9563G0007
4	41304G15	103T9563G0007	4	41304G08	103T9563G0007
5	16GL32041	103T9563G0007	5	16GL31365	103T9563G0007
6	16GL32049	103T9563G0007	6	16GL31524	103T9563G0007
7	16GL31635	103T9563G0007	7	16GL307	103T9563G0007
8	1304G01R1	103T9563G0007	8	1304G10	103T9563G0007
9	16GL32145	103T9563G0007	9	16GL31398	103T9563G0007
10	16GL31627	103T9563G0007	10	16GL31307	103T9563G0007
11	16GL31302	103T9563G0007	11	1304G03	103T9563G0007
12	16GL32050	103T9563G0007	12	1304G12	103T9563G0007
13	1304G13	103T9563G0007	13	16GL31305	103T9563G0007
14	16GL32047	103T9563G0007	14	16GL32043	103T9563G0007
15	16GL31304	103T9563G0007	15	16GL32053	103T9563G0007
16	16GL31614	103T9563G0007	16	1304G15	103T9563G0007
17	1304G17	103T9563G0007	17	1304G09	103T9563G0007
18	1304G18	103T9563G0007	18	16GL32158	103T9563G0007

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6.1 Combustion

LINER ASSY

Parts In			Parts Out		
Location	Part No	Part No	Location	Serial No	Part No
SET	LINER ASSY 9FA	101T4977G001	SET	LINER ASSY 9FA	101T5219G001
1	16-09-833	101T4977G001	1	17-02-1656	101T4977G001
2	17-02-814	101T4977G002	2	17-02-814	101T4977G002
3	17-02-815	101T4977G002	3	17-02-815	101T4977G002
4	17-02-1657	101T4977G001	4	17-02-1657	101T4977G001
5	17-02-1658	101T4977G001	5	17-02-1658	101T4977G001
6	17-02-1659	101T4977G001	6	17-02-1659	101T4977G001
7	17-02-1660	101T4977G001	7	17-02-1660	101T4977G001
8	17-02-1661	101T4977G001	8	17-02-1661	101T4977G001
9	17-02-1662	101T4977G001	9	17-02-1662	101T4977G001
10	17-02-1663	101T4977G001	10	17-02-1663	101T4977G001
11	17-02-1664	101T4977G001	11	17-02-1664	101T4977G001
12	17-02-1665	101T4977G001	12	17-02-1665	101T4977G001
13	17-02-1666	101T4977G001	13	17-02-1666	101T4977G001
14	17-02-1657	101T4977G001	14	17-02-1657	101T4977G001
15	17-03-1403	101T4977G003	15	17-03-1403	101T4977G003
16	17-03-1404	101T4977G003	16	17-03-1404	101T4977G003
17	17-03-1405	101T4977G003	17	17-03-1405	101T4977G003
18	17-03-1406	101T4977G003	18	17-03-1406	101T4977G003

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Imagination at Work

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6.1 Combustion

TRANS PIECE

Parts In			Parts Out		
Location	Serial No	Part No	Location	Serial No	Part No
SET	TRANS PIECE 9FA	117T5219G0002	SET	TRANS PIECE 9FA	117T5219G0002
1	17-01-081	117T5219G0002	1	17-07-1202	117T5219G0002
2	17-01-082	117T5219G0002	2	17-07-1203	117T5219G0002
3	17-01-083	117T5219G0002	3	17-07-1204	117T5219G0002
4	17-01-084	117T5219G0002	4	17-07-1205	117T5219G0002
5	17-01-085	117T5219G0002	5	17-07-1206	117T5219G0002
6	17-01-086	117T5219G0002	6	17-07-1207	117T5219G0002
7	17-01-087	117T5219G0002	7	17-07-1208	117T5219G0002
8	17-01-088	117T5219G0002	8	17-07-1209	117T5219G0002
9	17-01-089	117T5219G0002	9	17-07-1210	117T5219G0002
10	17-01-090	117T5219G0002	10	17-07-1211	117T5219G0002
11	17-01-091	117T5219G0002	11	17-07-1212	117T5219G0002
12	17-01-092	117T5219G0002	12	17-07-1213	117T5219G0002
13	17-01-093	117T5219G0002	13	17-07-1214	117T5219G0002
14	17-01-094	117T5219G0002	14	17-07-1215	117T5219G0002
15	17-01-095	117T5219G0002	15	17-07-1216	117T5219G0002
16	17-01-096	117T5219G0002	16	17-07-1217	117T5219G0002
17	17-01-097	117T5219G0002	17	17-07-1218	117T5219G0002
18	17-01-098	117T5219G0002	18	17-07-1219	117T5219G0002

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6.2 Hot Gas Path

STG1 BUCKET

Parts In			Parts Out		
Location	Serial No	Part No	Location	Serial No	Part No
SET			SET	STG1 BUCKET 9FA	107T5553G0003
1	N1MP013960	127T3805G0002	1	N1MP007087	112T5652G0002
2	N1ME001810	127T3805G0001	2	N1MP006824	112T5652G0001
3	N1ME001735	127T3805G0001	3	N1MP006994	112T5652G0001
4	N1MP014097	127T3805G0001	4	N1MP007159	112T5652G0001
5	N1ME001732	127T3805G0001	5	N1MP006890	112T5652G0001
6	N1ME001829	127T3805G0001	6	N1MP007117	112T5652G0001
7	N1ME001764	127T3805G0001	7	N1MP006864	112T5652G0001
8	N1MP012913	127T3805G0001	8	N1MP006868	112T5652G0001
9	N1ME001768	127T3805G0001	9	N1MP007245	112T5652G0001
10	N1ME001754	127T3805G0001	10	N1MP007204	112T5652G0001
11	N1ME001792	127T3805G0001	11	N1MP007062	112T5652G0001
12	N1ME001746	127T3805G0001	12	N1MP006861	112T5652G0001
13	N1VP014024	127T3805G0001	13	N1MP007077	112T5652G0001
14	N1VP014450	127T3805G0001	14	N1MP006944	112T5652G0001
15	N1ME001731	127T3805G0001	15	N1MP006777	112T5652G0001
16	N1VP014317	127T3805G0001	16	N1MP006101	112T5652G0001
17	N1MP013250	127T3805G0001	17	N1MP007140	112T5652G0001
18	N1VP014289	127T3805G0001	18	N1MP007056	112T5652G0001
19	N1ME001773	127T3805G0001			

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GE Power Power Services

6.2 Hot Gas Path

STG1 BUCKET

Parts In			Parts Out		
Location	Serial No	Part No	Location	Serial No	Part No
20	N1MP014249	127T3805G0001	19	N1.M.P007136	112T5652G0001
21	N1MP014231	127T3805G0001	20	N1.M.P007244	112T5652G0001
22	N1MP014177	127T3805G0001	21	N1.M.P006833	112T5652G0001
23	N1MP014312	127T3805G0001	22	N1.M.P006740	112T5652G0001
24	N1ME001819	127T3805G0001	23	N1.M.P006763	112T5652G0001
25	N1ME001729	127T3805G0001	24	N1.M.P006850	112T5652G0001
26	N1ME001825	127T3805G0001	25	N1.M.P007142	112T5652G0001
27	N1MP010176	127T3805G0001	26	N1.M.P006746	112T5652G0001
28	N1ME001901	127T3805G0001	27	N1.M.P006988	112T5652G0001
29	N1ME001763	127T3805G0001	28	N1.M.P007154	112T5652G0001
30	N1MP013144	127T3805G0001	29	N1.M.P006753	112T5652G0001
31	N1ME001821	127T3805G0001	30	N1.M.P007040	112T5652G0001
32	N1ME001774	127T3805G0001	31	N1.M.P007210	112T5652G0001
33	N1MP010172	127T3805G0001	32	N1.M.P007166	112T5652G0001
34	N1MP012567	127T3805G0001	33	N1.M.P006881	112T5652G0001
35	N1ME001954	127T3805G0001	34	N1.M.P006982	112T5652G0001
36	N1ME001817	127T3805G0001	35	N1.M.P007144	112T5652G0001
37	N1ME001741	127T3805G0001	36	N1MP007597	112T5652G0001
38	N1ME001760	127T3805G0001	37	N1MP006692	112T5652G0001
39	N1ME001776	127T3805G0001	38	N1MP007266	112T5652G0001

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GE Power Power Services

6.2 Hot Gas Path

STG1 BUCKET

Parts In			Parts Out		
Location	Serial No	Part No	Location	Serial No	Part No
40	N1MP014233	127T3805G0001	39	N1MP007128	112T5652G0001
41	N1MP014295	127T3805G0001	40	N1MP007066	112T5652G0001
42	N1MP013306	127T3805G0001	41	N1MP006880	112T5652G0001
43	N1VE001816	127T3805G0001	42	N1MP007131	112T5652G0001
44	N1MP013784	127T3805G0001	43	N1MP007113	112T5652G0001
45	N1VE014445	127T3805G0001	44	N1MP006816	112T5652G0001
46	N1VE001927	127T3805G0001	45	N1MP007000	112T5652G0001
47	N1VE001921	127T3805G0001	46	N1MP006939	112T5652G0001
48	N1VE001771	127T3805G0001	47	N1MP007115	112T5652G0001
49	N1VE001775	127T3805G0001	48	N1MP006875	112T5652G0001
50	N1VE001748	127T3805G0001	49	N1MP006968	112T5652G0001
51	N1VE001781	127T3805G0001	50	N1MP006909	112T5652G0001
52	N1MP014452	127T3805G0001	51	N1MP006765	112T5652G0001
53	N1VE001766	127T3805G0001	52	N1MP007091	112T5652G0001
54	N1MP012609	127T3805G0001	53	N1MP006702	112T5652G0001
55	N1VE001796	127T3805G0001	54	N1MP007035	112T5652G0001
56	N1MP014128	127T3805G0001	55	N1MP007366	112T5652G0001
57	N1MP013991	127T3805G0001	56	N1MP007107	112T5652G0001
58	N1MP014183	127T3805G0001	57	N1MP006784	112T5652G0001
59	N1MP014315	127T3805G0001	58	N1MP007125	112T5652G0001

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GE Power Power Services

6.2 Hot Gas Path

STG1 BUCKET

Parts In			Parts Out		
Location	Serial No	Part No	Location	Serial No	Part No
60	N1MP014193	127T3805G0001	59	N1MP006992	112T5652G0001
61	N1ME001831	127T3805G0001	60	N1MP007163	112T5652G0001
62	N1MP014022	127T3805G0001	61	N1MP006744	112T5652G0001
63	N1MP013221	127T3805G0001	62	N1MP004496	112T5652G0001
64	N1MP014251	127T3805G0001	63	N1MP006792	112T5652G0001
65	N1ME001751	127T3805G0001	64	N1MP007161	112T5652G0001
66	N1MP014157	127T3805G0001	65	N1MP007101	112T5652G0001
67	N1MP014443	127T3805G0001	66	N1MP006871	112T5652G0001
68	N1ME001765	127T3805G0001	67	N1MP007042	112T5652G0001
69	N1MP014229	127T3805G0001	68	N1MP007155	112T5652G0001
70	N1MP012585	127T3805G0001	69	N1MP007079	112T5652G0001
71	N1MP014427	127T3805G0001	70	N1MP007202	112T5652G0001
72	N1MP014108	127T3805G0001	71	N1MP006157	112T5652G0001
73	N1ME001827	127T3805G0001	72	N1MP006930	112T5652G0001
74	N1MP014322	127T3805G0001	73	N1MP006407	112T5652G0001
75	N1MP014441	127T3805G0001	74	N1MP006898	112T5652G0001
76	N1MP014244	127T3805G0001	75	N1MP006985	112T5652G0001
77	N1MP014253	127T3805G0001	76	N1MP006804	112T5652G0001
78	N1ME001770	127T3805G0001	77	N1MP006983	112T5652G0001
79	N1ME001734	127T3805G0001	78	N1MP006917	112T5652G0001

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6.2 Hot Gas Path

STG1 BUCKET

Parts In			Parts Out		
Location	Serial No	Part No	Location	Serial No	Part No
80	N1ME001759	127T3805G0001	79	N1MP007139	112T5652G0001
81	N1ME001750	127T3805G0001	80	N1MP007180	112T5652G0001
82	N1ME001796	127T3805G0001	81	N1MP007036	112T5652G0001
83	N1MP013973	127T3805G0001	82	N1MP007098	112T5652G0001
84	N1ME001801	127T3805G0001	83	N1MP006960	112T5652G0001
85	N1MP014126	127T3805G0001	84	N1MP007200	112T5652G0001
86	N1ME001950	127T3805G0001	85	N1MP006794	112T5652G0001
87	N1ME001758	127T3805G0001	86	N1MP006860	112T5652G0001
88	N1MP014304	127T3805G0001	87	N1MP007072	112T5652G0001
89	N1ME001722	127T3805G0001	88	N1MP006876	112T5652G0001
90	N1MP014444	127T3805G0001	89	N1MP006042	112T5652G0001
91	N1MP014179	127T3805G0001	90	N1MP007130	112T5652G0001
92	N1MP014208	127T3805G0001	91	N1MP006884	112T5652G0001
			92	N1MP006544	112T5652G0001

STG1 NOZZLE

Parts In			Parts Out		
Location	Serial No	Part No	Location	Serial No	Part No
SET	STG1 NOZZLE 9FA	107T6377G0001	SET	STG1 NOZZLE 9FA	107T6377G0001
1	A1JM08435	107T6377G0010	1	A1JM03072	107T6377G0001

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6.2 Hot Gas Path

STG1 NOZZLE

Parts In			Parts Out		
Location	Serial No	Part No	Location	Serial No	Part No
2	A1JM08556	107T6377G0010	2	A1JM04897	107T6377G0001
3	A1JM07568	107T6377G0010	3	A1JM04274	107T6377G0001
4	A1JM08590	107T6377G0010	4	A1JM04833	107T6377G0001
5	A1JM08534	107T6377G0010	5	A1JM03552	107T6377G0001
6	A1JM08690	107T6377G0010	6	A1JM03435	107T6377G0001
7	A1JM08587	107T6377G0010	7	A1JM03911	107T6377G0001
8	A1JM08436	107T6377G0010	8	A1JM04092	107T6377G0001
9	A1JM08561	107T6377G0010	9	A1JM02563	107T6377G0001
10	A1JM08211	107T6377G0010	10	A1JM04561	107T6377G0001
11	A1JM08415	107T6377G0010	11	A1JM04315	107T6377G0001
12	A1JM08538	107T6377G0010	12	A1JM03832	107T6377G0001
13	A1JM08527	107T6377G0010	13	A1JM03686	107T6377G0001
14	A1JM08532	107T6377G0010	14	A1JM03519	107T6377G0001
15	A1JM08411	107T6377G0010	15	A1JM04206	107T6377G0001
16	A1JM08702	107T6377G0010	16	A1JM04278	107T6377G0001
17	A1JM08543	107T6377G0010	17	A1JM03332	107T6377G0001
18	A1JM08570	107T6377G0010	18	A1JM02618	107T6377G0001
19	A1JM08624	107T6377G0010	19	A1JM02628	107T6377G0001
20	A1JM08529	107T6377G0010	20	A1JM03668	107T6377G0001
21	A1JM08448	107T6377G0010	21	A1JM01369	107T6377G0001

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6.2 Hot Gas Path

STG1 NOZZLE

Parts In			Parts Out		
Location	Serial No	Part No	Location	Serial No	Part No
22	A1JM01812	107T6377G0010	22	A1JM01426	107T6377G0001
23	A1JM08397	107T6377G0010	23	A1JM04881	107T6377G0001
24	A1JM08401	107T6377G0010	24	A1JM03224	107T6377G0001
25	A1JM08503	107T6377G0010	25	A1JM03179	107T6377G0001
26	A1JM08408	107T6377G0010	26	A1JM04867	107T6377G0001
27	A1JM08565	107T6377G0010	27	A1JM04307	107T6377G0001
28	A1JM08447	107T6377G0010	28	A1JM03946	107T6377G0001
29	A1JM08546	107T6377G0010	29	A1JM02934	107T6377G0001
30	A1JM08386	107T6377G0010	30	A1JM03343	107T6377G0001
31	A1JM08243	107T6377G0010	31	A1JM05036	107T6377G0001
32	A1JM08531	107T6377G0010	32	A1JM04532	107T6377G0001
33	A1JM07218	107T6377G0010	33	A1JM02875	107T6377G0001
34	A1JM08404	107T6377G0010	34	A1JM02941	107T6377G0001
35	A1JM08669	107T6377G0010	35	A1JM04548	107T6377G0001
36	A1JM08666	107T6377G0010	36	A1JM03150	107T6377G0001
37	A1JM08544	107T6377G0010	37	A1JM04395	107T6377G0001
38	A1JM08315	107T6377G0010	38	A1JM04760	107T6377G0001
39	A1JM08583	107T6377G0010	39	A1JM03872	107T6377G0001
40	A1JM08579	107T6377G0010	40	A1JM01159	107T6377G0001
41	A1JM08578	107T6377G0010	41	A1JM04658	107T6377G0001

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6.2 Hot Gas Path

STG1 NOZZLE

Parts In			Parts Out		
Location	Serial No	Part No	Location	Serial No	Part No
42	A1JM08332	107T6377G0010	42	A1JM02656	107T6377G0001
43	A1JM08601	107T6377G0010	43	A1JMC3919	107T6377G0001
44	A1JM08450	107T6377G0010	44	A1JM09554	107T6377G0001
45	A1JM08568	107T6377G0010	45	A1JMC4111	107T6377G0001
46	A1JM08668	107T6377G0010	46	A1JM05080	107T6377G0001
47	A1JM08589	107T6377G0010	47	A1JM04887	107T6377G0001
48	A1JM08597	107T6377G0010	48	A1JM02955	107T6377G0001

STG1 SHROUD

Parts In			Parts Out		
Location	Serial No	Part No	Location	Serial No	Part No
SET			SET		
			1	1157428-01	107T8015G0002
			2	1157428-02	107T8015G0002
			3	1157428-03	107T8015G0002
			4	1157428-04	107T8015G0002
			5	1157428-05	107T8015G0002
			6	1157428-06	107T8015G0002
			7	1157428-07	107T8015G0002
			8	1157428-08	107T8015G0002

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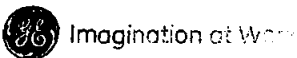
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6.2 Hot Gas Path

STG1 SHROUD

Parts Out		
Location	Serial No	Part No
9	1157428-09	107T8015G0002
10	1157428-10	107T8015G0002
11	1157428-11	107T8015G0002
12	1157428-12	107T8015G0002
13	1157428-13	107T8015G0002
14	1157428-14	107T8015G0002
15	1157428-15	107T8015G0002
16	1157428-16	107T8015G0002
17	1157428-17	107T8015G0002
18	1157428-18	107T8015G0002
19	1157428-19	107T8015G0002
20	1157428-20	107T8015G0002
21	1157428-21	107T8015G0002
22	1157428-22	107T8015G0002
23	1157428-23	107T8015G0002
24	1157428-24	107T8015G0002
25	1157428-25	107T8015G0002
26	1157428-26	107T8015G0002
27	1157428-27	107T8015G0002
28	1157428-28	107T8015G0002

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6.2 Hot Gas Path

STG1 SHROUD

Parts Out		
Location	Serial No	Part No
29	1157428-29	10778015G0002
30	1157428-30	10778015G0002
31	1157428-31	10778015G0002
32	1157428-32	10778015G0002
33	1157428-33	10778015G0002
34	1157428-34	10778015G0002
35	1157428-35	10778015G0002
36	1157428-36	10778015G0002
37	1157428-37	10778015G0002
38	1157428-38	10778015G0002
39	1157428-39	10778015G0002
40	1157428-40	10778015G0002

STG2 BUCKET

Parts In			Parts Out		
Location	Serial No	Part No	Location	Serial No	Part No
SET			SET		
			1	N2MPC04*32	10775592G0004
			2	N2MPC04291	10775592G0003
			3	N2MPC04245	10775592G0003

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6.2 Hot Gas Path

STG2 BUCKET

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Parts Out		
Location	Serial No	Part No
4	N2MP004361	107T5592G0003
5	N2MP004461	107T5592G0003
6	N2MP003778	107T5592G0003
7	N2MP003948	107T5592G0003
8	N2MP004190	107T5592G0003
9	N2MP004366	107T5592G0003
10	N2MP004221	107T5592G0003
11	N2MP003962	107T5592G0003
12	N2MP004258	107T5592G0003
13	N2MP004134	107T5592G0003
14	N2MP003843	107T5592G0003
15	N2MP001410	107T5592G0003
16	N2MP004297	107T5592G0003
17	N2MP004102	107T5592G0003
18	N2MP004078	107T5592G0003
19	N2MP004117	107T5592G0003
20	N2MP004389	107T5592G0003
21	N2MP007383	107T5592G0003
22	N2MP008202	107T5592G0003
23	N2MP004193	107T5592G0003

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6.2 Hot Gas Path

STG2 BUCKET

Parts Out		
Location	Serial No	Part No
24	N2MPC04163	107T5592G0003
25	N2MPC04251	107T5592G0003
26	N2MPC04155	107T5592G0003
27	N2MPC04144	107T5592G0003
28	N2MPC04249	107T5592G0003
29	N2MPC04137	107T5592G0003
30	N2MPC04149	107T5592G0003
31	N2MPC04022	107T5592G0003
32	N2MPC04438	107T5592G0003
33	N2MPC04181	107T5592G0003
34	N2MPC04185	107T5592G0003
35	N2MPC04261	107T5592G0003
36	N2MPC04151	107T5592G0003
37	N2MPC07289	107T5592G0003
38	N2MPC04124	107T5592G0003
39	N2MPC04138	107T5592G0003
40	N2MPC04133	107T5592G0003
41	N2MP004265	107T5592G0003
42	N2MP007666	107T5592G0003
43	N2MP004284	107T5592G0003

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6.2 Hot Gas Path

STG2 BUCKET

Parts Out		
Location	Serial No	Part No
44	N2MP004242	107T5592G0003
45	N2MP004268	107T5592G0003
46	N2MP004097	107T5592G0003
47	N2MP004305	107T5592G0003
48	N2MP004139	107T5592G0003
49	N2MP004226	107T5592G0003
50	N2MP004148	107T5592G0003
51	N2MP003835	107T5592G0003
52	N2MP004158	107T5592G0003
53	N2MP004129	107T5592G0003
54	N2MP004207	107T5592G0003
55	N2MP004300	107T5592G0003
56	N2MP004489	107T5592G0003
57	N2MP008264	107T5592G0003
58	N2MP004272	107T5592G0003
59	N2MP004105	107T5592G0003
60	N2MP004106	107T5592G0003
61	N2MP004490	107T5592G0003
62	N2MP003820	107T5592G0003
63	N2MP004160	107T5592G0003

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6.2 Hot Gas Path

STG2 BUCKET

Parts Out		
Location	Serial No	Part No
64	N2MP004152	107T5592G0003
65	N2MP004023	107T5592G0003
66	N2MP004327	107T5592G0003
67	N2MP004500	107T5592G0003
68	N2MP004352	107T5592G0003
69	N2MP004108	107T5592G0003
70	N2MP004286	107T5592G0003
71	N2MP007938	107T5592G0003
72	N2MP008072	107T5592G0003
73	N2MP008370	107T5592G0003
74	N2MP004103	107T5592G0003
75	N2MP004021	107T5592G0003
76	N2MP004376	107T5592G0003
77	N2MP004007	107T5592G0003
78	N2MP004248	107T5592G0003
79	N2MP004175	107T5592G0003
80	N2MP004131	107T5592G0003
81	N2MP004299	107T5592G0003
82	N2MP004137	107T5592G0003
83	N2MP004392	107T5592G0003

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LARGE CALL-OUT - 299041



Imagination at Work

CENTRAL POWER GENERATION COMPANY LTD

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GUDDU

GE Power Power Services

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6.2 Hot Gas Path

STG2 BUCKET

Parts Out		
Location	Serial No	Part No
84	N2MP004146	107T5592G0003
85	N2MP004172	107T5592G0003
86	N2MP004426	107T5592G0003
87	N2MP004165	107T5592G0003
88	N2MP004379	107T5592G0003
89	N2MP004203	107T5592G0003
90	N2MP004118	107T5592G0003
91	N2MP004282	107T5592G0003
92	N2MP003920	107T5592G0003

STG2 NOZZLE

Parts In			Parts Out		
Location	Serial No	Part No	Location	Serial No	Part No
SET			SET		
1	P2JM04690	107T6388G0005	1	P2JM01806	107T6388G0005
2	P2JM04724	107T6388G0005	2	P2JM01975	107T6388G0005
3	P2JM04652	107T6388G0005	3	P2JM01860	107T6388G0005
4	P2JM04669	107T6388G0005	4	P2JM01867	107T6388G0005
5	P2JM04662	107T6388G0005	5	P2JM02030	107T6388G0005
6	P2JM04699	107T6388G0005	6	P2JM02003	107T6388G0005

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GE Power Power Services

6.2 Hot Gas Path

STG2 NOZZLE

Parts In			Parts Out		
Location	Serial No	Part No	Location	Serial No	Part No
7	P2JM04648	107T6388G0005	7	P2JM02035	107T6388G0005
8	P2JM04657	107T6388G0005	8	P2JM01932	107T6388G0005
9	P2JM04721	107T6388G0005	9	P2JM02019	107T6388G0005
10	P2JM04706	107T6388G0005	10	P2JM01791	107T6388G0005
11	P2JM04683	107T6388G0005	11	P2JM01913	107T6388G0005
12	P2JM04625	107T6388G0005	12	P2JM02005	107T6388G0005
13	P2JM04617	107T6388G0005	13	P2JM01999	107T6388G0005
14	P2JM04673	107T6388G0005	14	P2JM01953	107T6388G0005
15	P2JM04678	107T6388G0005	15	P2JM01809	107T6388G0005
16	P2JM04718	107T6388G0005	16	P2JM01935	107T6388G0005
17	P2JM04664	107T6388G0005	17	P2JM02062	107T6388G0005
18	P2JM04665	107T6388G0005	18	P2JM02072	107T6388G0005
19	P2JM04645	107T6388G0005	19	P2JM01982	107T6388G0005
20	P2JM04644	107T6388G0005	20	P2JM02006	107T6388G0005
21	P2JM04713	107T6388G0005	21	P2JM01983	107T6388G0005
22	P2JM04700	107T6388G0005	22	P2JM01970	107T6388G0005
23	P2JM04551	107T6388G0005	23	P2JM02044	107T6388G0005
24	P2JM04650	107T6388G0005	24	P2JM01678	107T6388G0005

STG2 SHROUD

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CENTRAL POWER GENERATION COMPANY LTD

GUDDU

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GE Power Power Services

6.2 Hot Gas Path

STG2 SHROUD

Parts In			Parts Out		
Location	Serial No	Part No	Location	Serial No	Part No
SET			SET		

STG3 BUCKET

Parts In			Parts Out		
Location	Serial No	Part No	Location	Serial No	Part No
SET			SET		

STG3 NOZZLE

Parts In			Parts Out		
Location	Serial No	Part No	Location	Serial No	Part No
SET			SET		

STG3 SHROUD

Parts In			Parts Out		
Location	Serial No	Part No	Location	Serial No	Part No
SET			SET		

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CENTRAL POWER GENERATION COMPANY LTD
GUDDU

SS 575

GE Power Power Services

6.3 Rotor

ROTOR

Parts In			Parts Out		
Location	Serial No	Part No	Location	Serial No	Part No
SET			SET		
1	FOM4277845UT	101T7365G017	1	FOM1239510UT	146E1844G007
2	MON200635UT2	102T3122G002	2	FOM1370037UT	100T7089G005

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CENTRAL POWER GENERATION COMPANY LTD

GUDDU

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BRIEF OF RESTORATION OF ST-16 GENERATOR

Sr#	Activity	Progress / Current Status
1	Generator Testing	M/s SGS was engaged to carry out the Generator testing for its Integrity Assessment and activity completed on 31 July, 2022.
2	Building structure Testing	The Non-Destructive Testing (NDT) of the ST-16 building was carried out through M/s Building Standard Ltd. Lahore under the supervision of the M/s NESPAK Lahore. The activity was completed on 01 August, 2022.
3	Transformer Testing	Mian Unit Transformer testing carried out by M/s PTESU, WAPDA new Kot-Lakhpat Lahore and activity completed on 26 August, 2022.
4	Lube Oil Testing	Purification of the ST-16 Turbine Lube Oil was performed by CPGCL own resources and activity completed on 15 August, 2022.
5	Overhead Crane at ST#16 Turbine Hall.	Restoration of Overhead Crane was critically required on Top Priority as a pre-requisite for rehabilitation work, particularly to lift the Generator and Turbine casings for damage assessment. Rehabilitation work has been successfully completed on 27.09.2022 on fast track along with third party load testing. Activity completed with third party successful load Testing on dated 27.09.2022.
6	Correspondence with HEI.	The Commercial Proposal ref No.HEI-CSC-GUDDU-2022-02R Dated 20 September, 2022 was submitted by HEI which was apprised to the BoD CPGCL in its 147 th Meeting dated 15.09.2022 for approvals. The BoD directives issued on dated 18.09.2022.
7	Technical Audit from international Engineer	As desired by the Prime Minister of Pakistan and in compliances of the directives of the MoE (Power Division), M/s VA consultant hired for the Technical Audit of the Fire Incident on ST-16. The activity was completed on 13 & 14 September, 2022.
8	Hiring of NESPAK for consultancy services.	As per the directive of BoD CPGCL Dated 15.09.2022, M/s NESPAK Lahore has been approached vide CEO CPGCL letter No. CEO/CPGCL/CE-TD/PM-V/916-21 Dated 28.09.22 for submission of their proposal regarding the evaluation of commercial proposal of HEI & providing consultancy services during the execution phase of the work. M/s NESPAK was subsequently submitted of financial proposal amounting to PKR. 1,800,000/- without taxes. The same case apprised to the BoD (By Circulation) for approvals.
9	Legal Advice for direct contract under PPRA	In compliance to the BoD directives, M/s Rizwan Faiz Associates were consulted for Legal Advise in the matter of Work award through Direct contract under PPRA Rule -2004.

ANNEX-Z

**PROJECT COST, INFORMATION REGARDING SOURCES AND
AMOUNTS OF ENQUIRY, AND DEBT**

Central Power Generation Company Limited

Detail of Project cost, Debt and Equity (Approved by NEPRA)

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Capital Structure of the Project	Unit	Debt	Equity	Project Cost
Debt Equity Ration	%	71%	29%	100%
Local Debt (CDL)	Rs. In Million	7,873.397		7,873.397
Foreign Debt		45,858.217		45,858.217
Equity			21,686.891	21,686.891
Total		53,731.614	21,686.891	75,418.505

(579)

ANNEX-AA

PLANT CHARACTERISTICS

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PLANT CHARACTERISTICS

1	Generation Voltage	2 x Gas Turbines	1 x Steam Turbine
		15kV	20kV
2	Frequency	50Hz	
3	Power Factor	0.85	
4	Automation Generation Control	Yes	
5	Gas Turbine Efficiency	32.96% on Gas (HHV)	
6	Combined Cycle Efficiency	49.19% on Gas (HHV) 45.82% on HSD	
7	Auxiliary Consumption	26.21 MW	
8	Ramping Rate (MW/min)	2 x Gas Turbines	1 x Steam Turbine
		17.357	1.891
9	Time required to synchronize to Grid and loading the Plant to full Load (hrs.)	2 x Gas Turbines	1 x Steam Turbine
		0.26	1.5

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ANNEX-BB

TRAINING AND DEVELOPMENT



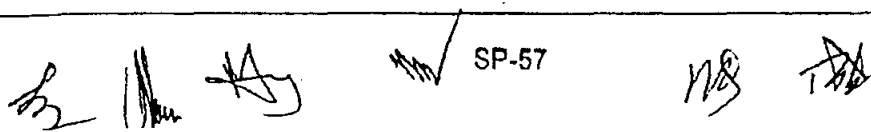
- c. Motors, valves, gauges, instruments, computer facilities, etc., shall be stored indoors in a warehouse provided by the Contractor. Motor windings and computer equipment and parts shall be kept dry by either the use of external heat, or energizing of the strip heaters in the motors.
 - d. Bearings and other machined wearing surface of machineries shall be protected against corrosion, and shall be kept clean.
 - e. Structural steel, miscellaneous steel, grating walkways, plate works, cable trays, housings, etc., shall be protected by a prime coat of paint prior to shipment, and shall be kept painted throughout the storage and erection period to prohibit rusting unless such items are galvanized or have other corrosion proof finish.
 - f. Thermal insulation shall be stored indoors in the warehouse provided by the Contractor, or otherwise protected against water damage.
- 3) All packing boxes, shipping containers (except shipping containers owned by the transportation companies), planking covering, etc., shall become the property of the Employer as soon as the equipment and material which is contained therein arrive at the Site. The Employer, on the application from the Contractor, may permit the Contractor to use some of the boxes, containers, etc., without charge for equipment and material storage purposes.

SP-17 TRAINING FACILITIES FOR EMPLOYER'S STAFF

1) Foreign Training

The Contractor shall train twenty eight (28) members of engineers and technical staff of the Employer in the operation and maintenance of the equipment supplied. The total man-months of foreign training will be limited to fifty six (56). The anticipated training breakdown is as under:

<u>Training</u>	<u>Number of Engineers/ Technical staff</u>	<u>Total Man-months</u>
• Gas turbine-generator plant	10	20
• HRSG's steam turbine-generator		


 SP-57



(305)



and auxiliaries	06	12
• Microprocessor based control system	12	24

All transportation, living and miscellaneous expenses of the trainees including round trip economy class air ticket from Pakistan to the place of foreign training, meal and shelter costs, incidental expenses, and medical expenses or medical insurance shall be borne by the Contractor.

It is preferred that a portion of the training be at an operating facility utilizing the Contractor's equipment.

The Contractor shall furnish each trainee with a training manual on the first day of his arrival at the Contractor's works or other training facility.

2) Job Site Training

The Employer shall make available, free of cost to the Contractor, a suitable number of staff members for the purpose of on-the-job training. It shall be the responsibility of the Contractor to provide adequate training in a scheduled manner so that these members of the Employer's staff are capable of taking over the responsibility for operation and maintenance of the Plant and equipment at the time of Taking Over of such Plant and equipment.

The Contractor shall provide Video aids, slides, and technical films for training purposes to the Employer's staff. Such materials shall become the property of the Employer without any charge. Written material shall be provided to each trainee.

SP-18 MONTHLY PROGRESS REPORTS AND PHOTOGRAPHS

- 1) During the period of shop fabrication, the Contractor shall submit monthly shop progress reports in formats as approved by the Employer and/or the Engineer. Such monthly reports shall show the actual progress completed on the date of the report plotted against the schedule as given in the Contract, and shall be broken down so as to indicate status of purchased material, detailed shop schedule, shipping dates, etc.
- 2) The Contractor shall further submit, as part of the monthly progress reports described above, an anticipated progress schedule indicating his best estimate of the installation work to be performed during the ensuing three-month period.
- 3) When installation work commences at the Site, the Engineer shall provide the Contractor with a report in a standard format (which format shall be approved by the Employer and Engineer)

SP-58

Handwritten signatures and initials: [Signature], [Signature], [Signature], [Signature], [Signature], [Signature]



Central Power Generation Co. Ltd.
(GENCO-II)

(15)

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Contract

for

Operation Services

of

747MW(Gross) Combined Cycle Power Plant (CCPP)

GUDDU PAKISTAN

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Foroword

This proposal for Operallon Service of PAKISTAN GUDDU 747MW Combined Cycle Power Plant, is provided ns per the combination of HEI roquost, needs of client, actual condillons of this project and our servico experionco ovnr 10 plants, which only concerns lho Six months Operation servico after TOC is succossfully issued.

Any comment or request should be discussed, and this proposal shall be properly revised after mutual agreement.

1 Plant Description

PAKISTAN GUDDU 747MW CCGP Is equipped with 2 sets of GE 9FA gas turbine (243MW each), 2 sets of HRSG and 1 set of STG (261MW), a 3-bay 500kV swilchyard is also installed with HEI EPC contract. The modern systems such as MARK VIe and OVATION are utilizing for machines controls.

The modern equipments and the latest design philosophy give more challenge to the O&M team.

2 Operation Service Staffing

- i) See item 5.

3 Operation Service Schedule

- i) *The commencement date of the Contract should be calculated from February 1st, 2015.*
- ii) *The whole period of the Operation Service should be 6 (Six) months from the commencement date.*

AP *[Signature]*

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5 Total Amount of Operation Service

No	Post Title	Quantity	Unit price (USD) for one person one month	Subtotal (USD) for one month	Subtotal (USD) for six months	Remarks	
1	Administration						
1.1	Team Leader	1	16,400	16,400	98,400		
1.2	Transport person (Karachi)	1				Cost by HEI	
1.3	O&M Manager (Co-ordinator)	1	14,100	14,100	84,600		
1.4	Logistics managers	1				Cost by HEI	
1.5	Cook	2	7,000	14,000	84,000		
	Sub-total	6		44,500	267,000		
2	Operation Group						
2.1	Shifted Operator	Shift Charge	1x4	12,500	50,000	300,000	
		GT Operator	1x4	10,650	42,600	255,600	
		ST Operator	2x4	10,650	85,200	511,200	
		HRSO Operator	2x4	10,650	85,200	511,200	
		Electrical Operator	1x4	10,650	42,600	255,600	
		Steam & Water Supervisor	1	9,700	9,700	58,200	
		Water Systems Operator	1x4	9,700	38,800	232,800	
		500KV Substation	1x4	9,700	38,800	232,800	
		Transformers	1x4	8,300	33,200	199,200	
2.2	Day-time Operator	H2 Generation Plant	1	9,700	9,700	58,200	
		Chemical Lab	1	9,700	9,700	58,200	
	Sub-total	43		445,500	2,673,000		
	TOTAL	49		490,000	2,940,000		
Remarks: - Operation team: 4 shifts.							

i) The total amount should be USD 2,940,000. (Say In US Dollars Two Million Nine Hundred and Forty Thousand only).

6 Working Days, Holidays and Working Time

i) The Working Days, Holidays and Working Time should be according to the plant working schedule during the 6 (Six) months operation service period.

4/3

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7 Obligations of HEI

- i) HEI shall ensure timely dispatch of qualified, rich-experienced specialists and technicians to fulfill the work. The specialists and technicians shall follow the working regulations of the country and co-operate fully with GENCO II team in successful and timely completion of work.
- ii) Provide visas, international air tickets and domestic air tickets in China and Pakistan.
- iii) Provide airport transportation personnel at Karachi for Chinese specialists and technicians' accommodation, food and transfer.
- iv) Provide food and traffic at site.
- v) Provide phone cards, phone charge, and internet charge.
- vi) Provide Chinese specialists and technicians' personal insurance.
- vii) HEI shall perform the services and carry out its obligations hereunder with all due diligence. Efficiency and economy in accordance with generally accepted techniques and practices commonly recognized by international professional bodies, and shall observe sound management, technical and engineering practices and employ appropriate technology and methods. HEI shall always act in respect of any matter relating to the services, as faithful advisors to the owner, and shall at all times support and safeguard the owner's interests in any dealings with subcontractors or third parties

8 Responsibility of GENCO II

- i) Provide necessary security (Including GENCO II security, Police, Ranger) for Chinese specialists and technicians between airports (Ranin Yar Khan airport or Sukkur) and Guddu site. Including security (Including GENCO II security, Police, Ranger) salary, Vehicle (Including Police Vehicle, Ranger Vehicle) use fee and fuel charge.
- ii) Provide necessary security (Including GENCO II security) for Chinese specialists and technicians between accommodation and Guddu site.
- iii) Provide necessary yard security (Including GENCO II security, Police, Ranger) during execution period of the Operation Service.

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②

②

(42)

(588)

- iv) Provide two furnished office at site, such as enough chairs, table, air conditioners for operation team from the available setup of the HEI EPC group.
- v) Arrange the payment to HEI as per agreed terms of payment.
- vi) Arrange enough and qualified operating personnel to work with operation team from HEI.
- vii) The operating personnel from GENCO II should operate according to HEI operation group's instructions. If the operating personnel from GENCO II do not operate according to HEI operation group's instructions, causing any problem should be borne by GENCO II otherwise it will be bear the part of HEI.
- viii) If the capability of workers from GENCO II is not satisfied, and causing the delay, that should be borne by GENCO II.
- ix) Assist HEI to get work visas.
- x) Provide necessary medical assistance to our specialists in case of any accident occurred at site.
- xi) GENCO-II should assure the safety and validity of the existing set-up of CPGCL residence and offices with required facilities during the 6 (Six) months operation Service.

9 Terms of Payment

- i) Progress Payment: 100% (Hundred) of the total amount of the contract, as progress payment, should be paid by TT.
 - a) The 1st month payment is 20% (Twenty) of the contract price. The following each month payment is 16% (Sixteen) of the contract price from 2nd month to 6th month.
 - b) The proforma invoice should be submitted by HEI at the close of each month, but not later than 2nd day of next month.
 - c) The each month payment should remit to the account specified by HEI within 15 natural days after receipt of proforma invoice.
- ii) The 1st Month payment is allowed to remit to the account specified by HEI before 31st March, 2015.

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(11)

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No	Date of Monthly Operation Service	Payment of Monthly Operation Service	Amount of proforma invoice	Date of proforma invoice submitted	Date of Payment remitted to the account
1 st	From 1 st February, 2015 to 28 th February, 2015	20% (Twenty) of the contract price. 588,000 USD (Say In US Dollars Five Hundred and Eighty-Eight Thousand only)	20% (Twenty) of the contract price. 588,000 USD (Say In US Dollars Five Hundred and Eighty-Eight Thousand only)	From 26 th February, 2015 to 28 th February, 2015	From 1 st March, 2015 to 31 st March, 2015
2 nd	From 1 st March, 2015 to 31 st March, 2015	16% (Sixteen) of the contract price. 470,400 USD (Say In US Dollars Four Hundred and Seventy Thousand Four Hundred only)	16% (Sixteen) of the contract price. 470,400 USD (Say In US Dollars Four Hundred and Seventy Thousand Four Hundred only)	From 29 th March, 2015 to 31 st March, 2015	From 1 st April, 2015 to 15 th April, 2015
3 rd	From 1 st April, 2015 to 30 th April, 2015	16% (Sixteen) of the contract price. 470,400 USD (Say In US Dollars Four Hundred and Seventy Thousand Four Hundred only)	16% (Sixteen) of the contract price. 470,400 USD (Say In US Dollars Four Hundred and Seventy Thousand Four Hundred only)	From 28 th April, 2015 to 30 th April, 2015	From 1 st May, 2015 to 15 th May, 2015
4 th	From 1 st May, 2015 to 31 st May, 2015	16% (Sixteen) of the contract price. 470,400 USD (Say In US Dollars Four Hundred and Seventy Thousand Four Hundred only)	16% (Sixteen) of the contract price. 470,400 USD (Say In US Dollars Four Hundred and Seventy Thousand Four Hundred only)	From 29 th May, 2015 to 31 st May, 2015	From 1 st June, 2015 to 15 th June, 2015
5 th	From 1 st June, 2015 to 30 th June, 2015	16% (Sixteen) of the contract price. 470,400 USD (Say In US Dollars Four Hundred and Seventy Thousand Four Hundred only)	16% (Sixteen) of the contract price. 470,400 USD (Say In US Dollars Four Hundred and Seventy Thousand Four Hundred only)	From 28 th June, 2015 to 30 th June, 2015	From 1 st July, 2015 to 15 th July, 2015

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(20)

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6 th	From 1 st July, 2015 to 31 st July, 2015	16% (Sixteen) of the contract price. 470,400 USD (Say In US Dollars Four Hundred and Seventy Thousand Four Hundred only)	16% (Sixteen) of the contract price. 470,400 USD (Say In US Dollars Four Hundred and Seventy Thousand Four Hundred only)	From 29 th July, 2015 to 31 st July, 2015	From 1 st August, 2015 to 15 th August, 2015
-----------------	--	--	--	---	--

iii) In the event of the failure of the GENCO II to make payment, HEI should suspend all the job in this proposal and all the related cost will be borne by GENCO II.

10 Taxes, duties, dues

- i) All the taxes, duties and dues including but not limited to income tax, sales tax, excise duty, storage, consumption and use taxes etc. occurred in Pakistan will be paid by GENCO II.
- ii) All the taxes, duties and dues including but not limited to income tax, sales tax, excise duty, storage, consumption and use taxes etc. occurred in China will be paid by HEI.
- iii) For audit purpose, the GENCO II shall provide copies of tax chalan if the HEI applies for.

12 Force Majeure

- i) In case execution of this contract is delayed for some time in connection with war, military actions, embargo, blockade, fire, natural disaster or other circumstances beyond partial or full non fulfillment of their obligations hereunder, HEI and GENCO II shall immediately meet each other and agree upon measures to be taken.
- ii) In case of such force majeure the period of fulfilling obligations shall be extended for the period these circumstances existed.
- iii) The certificate issued by the chamber of commerce of appropriate country of HEI or

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the GENCO II should be sufficient proof of these circumstances existence.

iv) Should either side of this contract desire to refer to force majeure clause it shall notify the other side in writing within 15 days from the moment the force majeure circumstances arose.

For and on behalf of

For and on behalf of

Harbin Electric International Company Limited (The Contractor)

Central Power Generation Co. Limited (The Employer)

Signature:

Signature:

Signed By:

Signed By:

Name *Zhang Yang*
Title *Chief Director*

Name MUHAMMAD KHALID ALY
Title CHIEF EXECUTIVE OFFICER.

Seal

Seal

Witness:

Witness: ZAFAR OMER FARUQI

Signature:

Signature:

PD-747 MW EUPDU

Signed By:

Signed By:

Name

Name

Title

Title

RF

RIZWAN FAIZ ASSOCIATES
Advocates & Solicitors

205 Areej Tower • H-11/3 (MPCHE) Market • Islamabad
Tel (051) 2375283 • Fax (051) 2375284 • Cell (0300) 2444244
rizwanfm@gmail.com

29th April 2015

CONFIDENTIAL & PRIVILEGED

Central Power Generation Company Limited
Thermal Power Station Guddu
Jamshoro

Attention: The Chief Executive

Dear Sir:

Re: Draft Services Contract with M/s Harbin Electric International

1. I refer to your request for the legal opinion on the draft services contract between Central Power Generation Company Limited ("CPGCL") and M/s Harbin Electric International ("HEI") for the operation of the 747 MW Combined Cycle Power Plant, at Guddu ("CCPP").
2. I have been informed by the project management that HEI started plant operation with effect from 31st December 2015, and the draft contract is proposed to begin from 1st February 2015, for a period of 6 months. Furthermore, it has been informed by the Project Director that without Harbin's involvement as plant operator, the CCPP cannot be operated at present.
3. It has further been informed that the CPGCL Board, in its 10th February 2015 meeting already gave approval for CPGCL to enter into a contract for plant operation with HEI with effect from 1st February 2015. In view of the fact that the parties have already covered a substantial period of the proposed contract period, it may be appropriate that a contract be signed with HEI without further delay.
4. I remain available for any further query in the matter.

Best regards,

Wassalam,

Rizwan Faiz Associates

Page 1 of 2

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FOR Rizwan Faiz Associates

(44)

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AMENDMENT NO.1

To

CONTRACT

For

Operation Services

Of

747MW(Gross) Combined Cycle Power Plant (CCPP)

GUDDU PAKISTAN

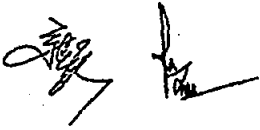
Between

Central Power Generation Co. Ltd.(GENCO-II)

AND

HARBIN ELECTRIC INTERNATIONAL COMPANY LIMITED

Date: April, 2016



(48)

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AMENDMENT NO. 1
TO
CONTRACT FOR OPERATION & SERVICES OF 747 MW CCPP, GUDDU, PAKISTAN

THIS AMENDMENT NO. 1 ("Amendment") is entered into on this 8th day of April 2016 by and between Central Power Generation Company Limited ("CPGCL") and M/s Harbin Electric International ("HEI").

WHEREAS CPGCL and HEI entered into a Contract for Operation and Service of CPGCL's 747 MW Combined Cycle Power Plant on February 1st 2015 ("Contract"), and are now desirous of making certain amendments thereto through this Amendment.

NOW THEREFORE, it is hereby agreed between CPGCL and HEI as follows:

1. In sub-clause (ii) of clause 3 of the Contract (*Operation Service Schedule*), the words "6 (Six) months" shall stand deleted and replaced with "7 (Seven) months, thereby including one additional month service which has been fulfilled by HEI in Aug. 2015."
2. In clause 5 of the Contract (*Total Amount of Operation Service*), an amount of USD 490,000/- shall be added to the total amount payable under the Contract to HEI for providing services under the Contract to CPGCL.
3. The remaining terms and conditions of the Contract shall remain unchanged.

IN WITNESS WHEREOF, the duly authorized representatives of the Parties have caused this Deed to be executed on the date first written above.

FOR AND ON BEHALF OF CENTRAL POWER GENERATION COMPANY (GENCO-II)

By: *M. L. Ali* 08/04/16

Title: CEP Guddu

Witnesses:

1. *[Signature]* 2. *[Signature]*

FOR AND ON BEHALF OF HARBIN ELECTRIC INTERNATIONAL

By: *[Signature]*

Title: Chief Director

Witnesses:

1. *[Signature]* 2. *[Signature]*



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ANNEX-CC

EFFICIENCY PARAMETERS

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EFFICIENCY PARAMETERS

Sr. No.	Description	Efficiency On LHV of Fuel (%)
1	Designed Net Efficiency of Power Plant	54.75
2	Gross Efficiency of Power Plant at Mean Site Conditions	56.48
3	Net Efficiency of Power Plant at Mean Site Conditions	54.48