STATE BANK OF INDIA
PROJECT FINANCE SBU

2x600 MW Coal Based Thermal Power Plant

DB Power Limited

Badadhara, Janjgir-Champa, Chhattisgarh

Annual O&M Review Report

FY 2020-2021

Lenders' Engineer

L&T – Sargent & Lundy Ltd.

CIN No. U74210MH1995PLC088099

Project No. LTSL - HL19043000

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REVISION SHEET:

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Contents

ACRONYMS

AAI	Airport Authority of India
ABT	Availability Based Tariff
ADD	Advance against Depreciation
APH	Air Pre Heater
BMCR	Boiler Maximum Continuous Rating
BMS	Burner Management System
BOP	Balance of Plant
BPOS	Boiler Performance Optimization System
BTG	Boiler Turbine and Generator
CCPC	Cross Country Pipe Conveyor
CCR	Common Control Room
CEA	Central Electricity Authority
CECB	Chhattisgarh Environment Conservation Board
CEP	Condensate Extraction Pump
CERC	Central Electricity Regulatory Commission
CIL	Coal India Limited
COD	Commercial Operation Date
CPCB	Central Pollution Control Board
CSEB	Chhattisgarh State Electricity Board
CTCW	Cooling Tower Circulating Water
CTU	Central Transmission Utility
DOWR	Department of Water Resources
DPR	Detailed Project Report
DBPL	DB Power Ltd
DSM	Deviation Settlement Mechanism
ECHP	External Coal Handling Plant
EIA	Environmental Impact Assessment
EPC	Engineering, Procurement & Construction
EPS	Electric Power Survey
ER	Eastern Region
ESP	Electro-static Precipitator
FY	Financial Year
FGD	Flue Gas De-Sulphurisation

FSA	Fuel Supply Agreement
GoCG	Government of Chhattisgarh
GoI	Government of India
HFO	Heavy Fuel Oil
HMI	Human Machine Interface
IDC	Interest During Construction
IEX	Indian Energy Exchange
IPP	Independent Power Producer
LDO	Light Diesel Oil
LE	Lender's Engineer
LILO	Line In Line Out
LLC	Lender's Legal Counsel
LOA	Letter of Award
MCR	Maximum Continuous Rating
MCL	Mahanadi Coalfields Limited
MoC	Ministry of Coal
MoEFCC	Ministry of Environment, Forest & Climate Change
MSL	Mean Sea Level
MTPA	Million Tons Per Annum
NDCT	Natural Draft Cooling Tower
NEERI	National Environmental Engineering Research Institute
NFPA	National Fire Protection Association
NIO	National Institute of Oceanography
NOC	No Objection Certificate
NOx	Oxides of Nitrogen
NR	Northern Region
NTP	Notice To Proceed
OHE	Over Head Electrification
OFA	Over Fire Air
PPA	Power Purchase Agreement
PT	Pre-Treatment
PTC	Power Trading Corporation
RCC	Reinforced Cement Concrete
RERC	Rajasthan Electricity Regulatory Commission

ROW	Right of Way
ROR	Rail Over Rail
RPC	Regional Power Committee
SBI	State Bank of India
SCAPH	Steam Coil Air Pre Heater
SEA	State Energy Account
SECL	South Eastern Coalfields Limited
SERC	State Electricity Regulatory Commission
SECR	South East Central Railway
SHR	Station Heat Rate
SLDC	State Load Dispatch Center
SO_x	Oxides of Sulphur
SPC	State power Committee
SPM	Suspended Particulate Matter
SR	Southern Region
STU	State transmission Utility
SWAS	Steam & Water Analysis System
TAC	Tariff Advisory Committee
TMCR	Turbine Maximum Continuous Rating
TOR	Terms of Reference
TPP	Thermal Power Plant
VWO	Valves Wide Open
WR	Western Region
WRD	Water Resources Department

1.0 INTRODUCTION

DB Power Ltd (DBPL), a private sector coal based Independent Power Producer (IPP), has set up 1200 MW (2x600 MW) thermal Power Project near village Badadhara, in Janjgir-Champa District in the State of Chhattisgarh.

SBI has engaged L&T - Sargent & Lundy Limited (L&T-S&L) as the Lender's Independent Engineer (LIE/LE) for Annual O&M review since FY 2018.

1.1 Objective

Objective of the report to give inside view on plant performance in O&M regime for FY 2020-2021 to the lenders. This report is been prepared based upon information, details, documents and workings shared by DBPL in various forms from time to time. Observations are based on inputs received from DBPL. Various aspects of the Plant have been analyzed in detail and findings/comments upon the same have been summarized in subsequent sections of this report.

1.2 Plant Overview

DB Power Ltd (DBPL) has developed a domestic coal based thermal power project with a generation capacity of 1200 MW (2 x 600 MW) at Raigarh, Chhattisgarh, India. DBPL has executed the Power project in two Phases of 600 MW each achieved COD as follows:

- Unit-1 (i.e.Phase-1) COD on 1st August 2015
- Unit-2 (i.e.Phase-2) COD on 26th March 2016

Plant location

The Project is located at latitude $20^0$54'44'' N and longitude $83^0$11'43" E, at village Badadhara of Janjgir-Champa District in the State of Chhattisgarh, India. The plot is spread over villages Badadhara, Rampur and Tundri. The project site is well connected by air, rail and road. Raipur is the nearest airport. The Project site is 20 km from Kharsia town and 25 km away from Raigarh. The Project is located at a distance of approx. 7 km from Mumbai-Howrah main line of S.E. Railways which runs east-west to the north of the plot. The nearest Railway Station is Robertson Railway Station about 15 km from the Project site. At the distance of 15 km, the nearest highway pass NH-200 (Raipur-Orissa) is located. The river Mahanadi flows from west to east at about 24 km south.

Source: Google Maps Image

Plant Technology:

The units are designed to operate with sub-critical technology. Boilers are designed for pulverized coal firing. Boiler, Turbine and Generator (BTG) along with their auxiliaries are supplied by BHEL. BHEL has proven track records of supplying such size of units in India. The design features are standard for the power plant of this size. L&T was awarded the balance of plant contracts viz. coal handling system, switch yard, ash handling system, fuel oil system, compressed air system, air conditioning system, illumination systems, water treatment plant, NDCT, chimney etc. on EPC basis. The other major contracts viz. transmission line, railway siding, captive road etc. were awarded to reputed contractors. The plant has been supplied, erected and commissioned through the Package route. Major package suppliers are as below table:

Table: Major Plant Packages and their Supplier

Sl. No.	Package	Awarded to
1	BTG Package	BHEL
2	Cooling Tower	TPPC
3	Ash Handling system	Indure
4	Pretreatment & DM Plant	Ion Exchange
5	Coal handling package	L&T-BMH
6	CW & ACW Pumps	KBL & BHEL respectively
7	Civil & Structures	Sunil Hi-tech, Nagpur
8	Wagon tippler	L&T

Land details:

During initial project stage a total 1371 acres of land requirement was envisaged with following breakup:

Table: Breakup of the total land requirement envisaged for project

Description	Phase I & II (Acre)
Main Power Plant (Initially Appraised) (A)	1077
Additional Land to be acquired:	
Additional Ash Dyke	117
Railway Siding	140
Green Belt & Miscellaneous	37
Additional Land required (B)	294
Total Requirement (A+B)	**1371**

Source: DBPL

Revised Land Requirement:

Further, company has proposed not to construct ROR and additional Ash Dyke-2 which has reduced the overall land requirement. The revised land requirement is depicted in table below:

Table: Revised Total Land Requirement and Acquired Land Details for project

Particulars	Phase I & II (Acre)
Initial total requirement	1371
Less: Land for Additional Ash Dyke	117
Less: Land for ROR	80
Less: Reduction of project land requirement required to make land contiguous / green belt etc.	12
Revised Land Requirement for the project	**1162**
Land Acquired	1162
Land Mortgaged in favour of lenders	1162

Source: DBPL

2.0 STATUS OF PLANT BACKWARD AND FORWARD LINKAGES

The plant is well connected with the sources of water, linkage of coal transport, power evacuation facilities and disposal of Ash.

Coal Linkage:

The primary fuel, coal for the project is sourced from the South Eastern Coalfields Ltd (SECL). DBPL has a Fuel supply agreement (FSA) with M/s. SECL (awarded on August 29, 2013) for the supply of 2.497 MTPA (LOA Quantity). As per FSA, the ACQ is subject to the signing of long-term PPA with DISCOMS either directly or through PTC and has an overall ceiling of LOA quantity. DBPL has long term PPA with TENGENCO & Rajasthan State Discom to supply 208 MW & 308 MW respectively (~92 % of net 564 MW capacity). Accordingly, ACQ under FSA is worked out as 2.294 MTPA. (~92%of LOA quantity)

In September 2020, MoC has recommended increasing the ACQ up to 100% in the cases where ACQ was reduced to 90% of the normative requirement. CIL vide email dtd. 11.09.2020 has communicated the list of the eligible power plants and advised for implementation of directives of SLC (LT). In the said list, normative requirement for DBPL is mentioned as 2.774 MTA for FY 2020-21. In proportionate to long term PPAs, ACQ worked out as 2.548 MTPA (~92% of 2.774 MTPA).

In line with the above, DBPL has signed a side agreement for the enhancement of ACQ. According to same ACQ under FSA dtd. 29.08.2013 stands revised from 2.294 MTPA to 2.548 MTPA. The modification is effective from the date of signing of the addendum i.e. 18.09.2020.

Weighted ACQ for FY 2020-21 is worked out as 2.43 Million Tones.

Linkage coal is being sourced from Kusmunda and Gevra mines of SECL located at approx. 120 km from the plant site and transported by a combination of rail/road network. Any additional coal requirement is being met through procurement of coal by Spot Auction, SHAKTI Scheme (Scheme for Harnessing and Allocating Koyala Transparently in India), E–auction route (including special forward E- auction scheme exclusively for power producers, wherein coal is being auctioned under separate window for power producers) and Open Market.

The coal procured through the different sources during FY 20-21 is given in table below:

Table: Coal Sources and Procurement (Receipt) during FY 20-21

Linkage (FSA) Coal Receipt FY 20-21 (in Tonne)		**Non Linkage Coal Receipt FY 20-21** (in Tonne)	
LOA (Averaged for FY)	249700	E-Auction	2637084
ACQ** (Averaged for FY)	24,37,017	Spot Auction	210211
FSA Coal Received in FY 20-21 (A)	24,45,323	SHAKTI	303580
Actual Realization (%) of ACQ in FY20-21	100.34	Open Market	59986
FSA Coal Received in FY 20-21 (A)	**24,45,323**	**Total- Non Linkage coal Receipt (B)**	**32,10,861**
Total Coal Receipt in FY (A+B)		**56,56,184 Tonne**	

*** ACQ 2.294 MTPA till amendment in September 2020, after amendment ACQ is 2.548 MTPA*
Source: DBPL

Monthly Coal Receipt and consumption during FY 2020-21 is tabulated below

Table: Monthly Coal Receipt and Consumption during FY 20-21

Month	**Coal receipt (Tonne)**			**Coal consumption (Tonne)**		
	FSA	**Non FSA**	**Total**	**FSA**	**Non FSA**	**Total**
Apr-20	2,21,335	94,582	3,15,916	2,51,697	26,263	2,77,960
May-20	2,49,251	33,505	2,82,756	1,79,812	2,64,039	4,43,851
Jun-20	1,32,452	3,69,740	5,02,191	2,12,489	2,79,056	4,91,545
Jul-20	1,57,745	2,55,462	4,13,207	1,66,928	3,66,706	5,33,634
Aug-20	2,10,782	2,91,686	5,02,468	2,03,612	2,75,856	4,79,468
Sep-20	1,96,400	2,86,223	4,82,624	2,04,555	2,53,800	4,58,355
Oct-20	1,95,478	3,39,329	5,34,807	1,81,999	2,71,328	4,53,327
Nov-20	1,46,711	4,36,028	5,82,739	1,60,209	3,44,798	5,05,007
Dec-20	1,88,697	3,46,238	5,34,935	1,82,798	3,51,668	5,34,466
Jan-21	2,87,909	3,12,737	6,00,646	2,39,726	2,57,242	4,96,968
Feb-21	2,04,055	1,98,984	4,03,039	2,35,278	2,83,966	5,19,244
Mar-21	2,56,113	2,46,347	5,02,460	2,70,259	3,54,146	6,24,405
Total	**24,46,927**	**32,10,861**	**56,57,788**	**24,89,361**	**33,28,869**	**58,18,230**

Source: DBPL

The main reason of difference in coal receipt and coal consumption was due to difference in opening (2,95,500 Tons) and closing (1,26,712 Tons) coal stock for the FY 2020-21.

DBPL has built a dedicated railway siding from nearby Robertson station situated about 14 km from project site for coal transportation by rail rakes to the site. The railway siding is commissioned in March'2019. All required facilities for handling coal through railways within plant boundary are operational. DBPL received 1st Coal rake on 26th March, 2019. Coal unloading system is equipped to unload two rail rakes simultaneously with two wagon tippler.

The coal procured under e-auction is being transported either by railway or road depending on the feasibility.

Initially, during project implementation, DBPL had envisaged construction of ROR at Robertson Railway station. However, presently DBPL is considering not going ahead with ROR construction. Company informed that Indian Railways is constructing two additional rail lines on this rail route to develop dedicated freight corridor to handle increased load of goods & passenger traffic. SECR has commissioned 3rd rail lane while the work on 4th rail lane is under progress. Also out of Six (6) private railway sidings envisaged at Robertson station only three (3) have become operational. Other three (3) railway sidings haven't been set up and expected load of Rakes anticipated initially in the master plan has been reduced. With this development, DBPL envisages that rail traffic on this route will not affect the movement of coal rail rake to DBPL. Further, DBPL have considered that after the completion of the works being carried out by SECR at Robertson station, one additional loop line shall be ready for engine reversal as & when required to handle DBPL Rakes at Roberson station without interfering main line traffic. In view of the above developments, DBPL is considering not going ahead with ROR construction.

Consultant opines, DBPL shall get assurance from Railway Authorities for the seamless movement of the coal rail rakes to the plant without ROR for remaining lifetime of the plant.

Water Linkage:

Water requirement for the project was envisaged from river Mahanadi, 24 km from the project site. The requirement of water for running the Plant is met from the Kalma Anicut in Mahanadi River. Water Resource Department of Chhattisgarh has approved drawl of 30 MCM water from River Mahanadi at Kalma Anicut vide letter F 4- 32/31/S-2/ OJPR/07 dated 27-Dec- 2008.

To ensure year-round availability of water to the Project, GoCG has constructed a weir (Kalma Barrage), where the adequate quantity of water is stored. The water from the weir is transported through a raw water pipeline.

Power Evacuation and Sale:

Power Evacuation from the Project is at 400 KV level. DBPL has constructed one 400 kV D/C transmission lines of Quad moose conductor from the power plant to 400/765 kV Kotra pooling station of PGCIL which is about 18 km from the Plant. The pooling station is further connected to PGCIL 765/400 kV Raipur pooling station.

DBPL is selling the power to Distribution agencies and utilities under long term Power Purchase Agreements, short term PPA's and through power exchange. DBPL has signed a long term Power Purchase Agreement on 19rd Aug 2013 with Tamil Nadu Generation and Distribution Company Limited (TANGEDCO) for a Gross capacity of 221 MW (Net capacity of 208 MW). Further, long term PPA for gross capacity of 436 MW (Net capacity of 410 MW) has been tied up with Rajasthan State DISCOM (through PTC India) and the gross capacity of 430 MW (Net capacity of 404 MW) has been tied up with Chhattisgarh State Power Trade Company.

The details of the signed off long term selling arrangement are given below:

DISCOM	Gross Capacity (MW)	Net Capacity (MW)	Effective from	Term (Years)
CSP Trade Co.	430*	404	From the date of COD	20
TANGEDCO	221	208	From 1st Feb, 2014.	15
Rajasthan State DISCOMs	436	410**	175 MW from 30th Nov, 2016 increased to 311 MW from 01st August 2018	25
Total	1087	1022		

Source: DBPL

* Company has executed long term PPA for 404 MW (Net) or Gross 430 MW with CSPTCL. However, presently DBPL is supplying 5% of net power generated under the contracted output as per the terms agreed in PPA. The Contracted Capacity i.e. 30% (360 MW) of aggregated capacity of the project is also in force, but CSPTCL is not off-taking the power presently. Further, additional 2.50% is not applicable due to post de-allocation of captive coal block within Chhattisgarh state based on Hon. Supreme Court order in September 2014.

** The company has executed long term PPA for 410 MW (Net) in November 2013, however, RERC vide its order dtd. July 22, 2015 approved PPA for 250 MW only. The company was supplying 250 MW power under Rajasthan PPA. The company challenged the said order, Honorable Supreme Court vide its order dtd. April 25, 2018 has directed Rajasthan State DISCOM to obtain 311 MW power from DBPL instead of 250 MW. The supply of additional 61 MW is commissioned & company started supply from September 2018.

Current status of Long term PPAs (as on June-2021):

Table: Current Status of long term PPAs

PPA with	% Tie-up (Generation Capacity)	Gross (MW)	Net (MW)	Levelised Bidding Tariff	Supply Commencement
CSP Trade Co.	5%	60	57	Variable Cost	COD of Both Units
TANGEDCO	19%	221	208	Rs.4.91/kWh	Aug 01, 2015 – 117 MW Oct 05, 2015 – 208 MW
Rajasthan Discoms	27%	331	311	Rs.4.81/kWh	Nov 30, 2016 – 175 MW Mar 26, 2017 – 250 MW Aug 01, 2018 – 311 MW
Total PPA Tie-up	51%	612	576		

Source: DBPL

Further, DBPL had emerged as successful bidder for supply of short term power under following short term bid during FY 2020-21

Table: Short term power sale for FY 2020-21

Procurer	Duration		Time (Hrs)		Qty.	Tariff
	From	To	From	To	MW	Rs/kWh
NPCL	01-Apr-20	31-Oct-20	19	24	100	4.89
Adani Distr.	08-Apr-20	30-Apr-20	0	24	25	3.12
			0	2	12.5	3.12
			22	24	12.5	3.12
Himachal	01-Dec-20	31-Dec-20	0	24	50	3.25
UPPCL	01-May-20	31-May-20	0	6	100	3.3
	01-May-20	31-May-20	19	24	100	4
	01-Jun-20	30-Jun-20	0	7	100	3.53
	01-Jun-20	30-Jun-20	19	24	100	4.07
Kerala	01-Apr-20	30-Apr-20	19	23	50	4.24
	01-May-20	31-May-20	19	23	50	4.24

Procurer	Duration		Time (Hrs)		Qty.	Tariff
	From	To	From	To	MW	Rs/kWh
KEIPL OAC	01-Oct-20	31-Mar-21	0	24	up to 50	2.62
KEIPL AMBA	01-Oct-20	30-Sep-21	0	24	9	2.6
MPL OAC	01-Sep-20	31-Mar-21	0	24	6.6	2.8
REFEX	01-Oct-20	28-Feb-21	0	24	up to 17	2.6
MPL Himachal-50MW	01-Dec-20	31-Mar-21	0	24	up to 50	3.25
GMR EON	01-Jan-21	31-Mar-21	8	23	8	4.34
Kreate OAC	01-Dec-20	31-Mar-21	0	24	7	2.62
Kreate Amba Shakti	01-Dec-20	31-Mar-21	0	24	9	2.6
APPCPL Ginni	01-Dec-20	31-Mar-21	0	24	8	2.65
MPL OAC	01-Dec-20	31-Mar-21	0	24	8.9	2.8
Refex Amba Shakti	01-Dec-20	31-Mar-21	0	24	12	2.63
APPCPL OAC	01-Jan-21	31-Mar-21	0	24	28	2.73
Prakash Sponge Iron	01-Dec-20	31-Mar-21	0	24	3	2.7
Sacn Energy	01-Dec-20	31-Mar-21	0	24	15	2.67
Rayalseema Industries	01-Dec-20	31-Mar-21	0	24	8	2.67
NVVN Rajasthan	01-Dec-20	28-Feb-21	6	18	50	3.39
TPTCL ACC	01-Dec-20	31-Mar-21	0	24	21	2.67
APPCPL OAC	01-Dec-20	31-Mar-21	0	24	3	2.48
Kreate OAC	01-Feb-21	31-Mar-21	0	24	3.8	Max (2.62 or IEX +5 Paisa)
Kreate Reliance	01-Feb-21	31-Mar-21	0	24	3.2	2.7
Kreate Amba Shakti	01-Feb-21	31-Mar-21	0	24	9	2.63
Kreate Manglore	01-Feb-21	31-Mar-21	0	24	2	2.9
APPCPL Ginni	01-Feb-21	30-Jun-21	0	24	8	2.69
MPL ATC Tires	01-Feb-21	31-Mar-21	0	24	6	2.75
MPL Assam Tubes	01-Feb-21	31-Mar-21	0	24	3.1	2.8
MPL Assam Tubes Additional	01-Feb-21	31-Mar-21	0	24	2.3	2.78
Refex Amba Shakti	01-Feb-21	31-Mar-21	0	24	12	2.63
APPCPL IPCL	01-Feb-21	31-Mar-21	9	18	16	2.75
APPCPL IPCL (10 days in month)	01-Feb-21	31-Mar-21	0	24	18	2.6
Global/Abja Prakash Sponge	01-Feb-21	31-Mar-21	0	24	5	2.7
Global Chemplast	01-Feb-21	31-Mar-21	0	24	7	2.69
TPTCL ACC Ambuja	01-Feb-21	31-Mar-21	0	24	21	2.67
APPCPL Ambika Steel	01-Feb-21	31-Mar-21	0	24	3	2.48
PTC OAC	01-Feb-21	30-Sep-21	0	24	7	2.7
Global LINDE	01-Feb-21	30-Sep-21	0	24	4	2.7

Procurer	Duration		Time (Hrs)		Qty.	Tariff
	From	To	From	To	MW	Rs/kWh
Global Praxiar	01-Feb-21	30-Sep-21	0	24	6	2.7
APPCPL OAC	01-Jun-21	30-Sep-21	0	24	71	2.4
GMR OAC(up to 50 MW RTC)	01-Feb-21	31-Jul-21	0	24	8	2.67
Refex UP OAC	01-Feb-21	31-Mar-21	0	24	21	2.69
PTC Rajasthan (Tender)	01-Apr-21	30-Sep-21	0	24	31	3.02
MPL GUVNL Tender	01-May-21	30-Jun-21	0	24	20	2.73
NVVN Rajasthan (Tender)	01-Feb-21	28-Feb-21	6	18	100	3.39
GMR Punjab Tender (Aug 16 to Sep 15)	01-Aug-21	30-Sep-21	0	24	65	3.37
MPL Punjab Tender	01-Aug-21	31-Aug-21	0	24	50	3.37
GMR BSES Rajdhani	June & Sep'21	June & Sep'21	0	24	50	3.15
PTC BSES Rajdhani	June & Sep'21	June & Sep'21	0	24	50	3.15
Refex UP OAC	01-Feb-21	31-Mar-21	0	24	30	2.69
Refex TN OAC	01-Feb-21	28-Feb-21	0	24	2	2.75
PTC OAC UP	01-Mar-21	30-Jun-21	0	24	60	2.7
APPCPL OAC-AVIL	01-Feb-21	30-Sep-21	0	24	5	2.7
Global Praxiar	01-Mar-21	30-Sep-21	0	24	54	2.8
GUVNL NVVN	01-May-21	31-May-21	0	24	70	2.93
Tamilnadu NVVN	01-Feb-21	31-May-21	0	24	50	3.15-3.29

Source: DBPL

DBPLs annual power sale in MUs during the FY 20-21 through different modes is shown in table below:

Table: Annual Power Sales during FY 20-21

Procurer	Power Schedule/ Demand/ Supply (MUs)	Declared Capacity PPAs (MUs)	Availability for PPAs
PPA- Tamil Nadu	1689.02	1729.41	94.91
PPA- Rajasthan	2258.19	2351.21	86.30
PPA- Chhattisgarh	323.80	-	-
Supply under Long Term PPA (A)	4271.01	-	-
Short Term PPA	1783.40	-	-
Merchant	1653.46	-	-
DSM	(-62.49)	-	-
Supply under Short Term (B)	**3374.37**	-	-
Total Supply during the year (A+B)	**7645.38**	-	-

Source: DBPL

Ash Disposal & Utilization

Presently, DBPL has designated Approx.110 acres of land for ash disposal. The Ash Dyke has been developed on the designated land and is divided into two lagoons, Lagoon-1 & Lagoon-2. The Ash Dyke-1 will be used for bottom ash disposal and for unutilized fly ash only in case of emergency. DBPL has put on hold the initially envisaged proposal of constructing 2nd dyke (Ash Dyke-2).

DBPL have installed dry fly ash extraction system with silos of adequate capacity of 1600 Tonne for each unit so that the ash generated during the power generation is collected in dry form. Unutilized fly ash is being disposed of in the ash dyke in the form of slurry. DBPL has achieved Ash utilization around 98.3 % of total ash generation (Fly ash + bottom ash) for FY 20-21.

Ash Generation and Utilization Report					
Month	Ash Generation (MT)			Ash Utilization (FA + stored dyke Ash) (MT)	% Utilization
	Bottom Ash	Fly Ash	Total		
Apr-20	22909	104365	127274	126204	99.16%
May-20	39340	157362	196702	228566	116.20%
Jun-20	43142	172568	215710	182710	84.70%
Jul-20	48886	195543	244429	194052	79.39%
Aug-20	42064	168255	210319	192187	91.38%
Sep-20	40190	160760	200950	182240	90.69%
Oct-20	43055	172220	215276	209632	97.38%
Nov-20	46018	184073	230091	267514	116.26%
Dec-20	49107	196428	245535	218796	89.11%
Jan-21	44958	179831	224788	282137	125.51%
Feb-21	47753	191011	238764	269187	112.74%
Mar-21	59179	236717	295896	247637	83.69%
FY 20-21	**526601**	**2119132**	**2645733**	**2600862**	**98.30%**

Source: DBPL

As per latest guidelines of MOEF & CC, Coal based TPP's have to ensure 100% ash utilization. Accordingly, DBPL have planned for 100% utilization of fly ash as well as pond ash. Therefore DBPL envisage no need for construction of 2nd number of ash dyke and considers that only existing Ash Dyke-1 having two (2) lagoons is sufficient to manage storage of bottom ash in accordance to operational requirements as well as to store fly ash in case of short lifting of fly ash by cement plants during rainy season.

Remaining capacity of existing Ash Dyke-1 is about ~10 (ten) months considering ash with 100 % fly ash utilization (i.e. no fly ash diversion to dyke) and about ~7 (seven) months with 10 % fly ash diversion as per the ash dyke residual life reported in March'21. Calculation is based on optimistic PLF of 90 %, Ash content of 45 % in coal and specific coal consumption of 0.70 Kg/kWh.

DBPL have provided Fly Ash utilization plan for FY21-22. As per plan, DBPL envisage 100% of generated ash utilization and also has a scope to utilize the stored pond ash. For Fly Ash Utilization, DBPL has tied up with cement manufacturers (Emami Cement, Ambuja Cement, Shree Cement, Nuvuco Cement etc.) for off take of Fly ash. DBPL also has plans to dump the Fly ash and Pond ash in nearby abandoned mines of SECL for which they are perusing with SECL. DBPL has got many numbers of NOCs for land filling and reclamation of low lying land in nearby areas. By managing ash utilization as per plan provided, DBPL will have to maintain sufficient balance capacity available all the time in existing ash dyke.

DBPL informed that they are also evacuating the stored pond ash to maintain balance capacity of ash dyke all the time by cyclical operation of lagoon-1 and lagoon-2 of the Ash Dyke.

In compliance with conditions of the Air and Water Consents, industry shall install fly ash bricks/products/manufacturing machine of capacity at least 170000 nos. per day (one lakh seventy Thousand per day) for proper utilization of ash generated within one year. Accordingly, DB Power has signed an agreement on 31.12.2018 with Mati kala Board, an NGO for installation and operation of bricks plant. DBPL has already identified and designated the required land for brick plant within plant boundary. DBPL is constantly following up with "Mati Kala Board, Raipur" for installation of Brick plant. As per latest information shared by DBPL, Mati Kala Board has approved budget allocation for Civil and electrical works but the installation of the ash brick plant is not started by Mati Kala Board on DBPL site till date. However, due to delayed response from Mati-kala Board, currently DBPL has planned to supply fly ash to the ash-brick manufacturing plants in nearby area. In FY20-21 about 53662 MT of Fly ash is supplied for manufacturing of Ash Bricks/ Blocks/ tiles and other ash based products.

LE's Observations / Comments

- *The plant is well connected and near to the water and coal sources.*
- *Railway System for transportation of coal to the plant is commissioned and operational.*
- *To operate the plant at full load on continuous basis with coal transportation through railway only, there will be a requirement to install third wagon tippler.*
- *With increased ACQ of 2.5487 MTPA, single unit can be operated at around 71 % yearly unit load factor considering design station heat rate (2252 kCal/kWh) and Coal GCV of 3300 kcal/kg.*
- *DBPL is heavily dependent on the E-auction coal to cater the long term PPAs requirements.*
- *During FY 20-21, DBPL has consumed total of 5.818 MTPA coal, procured 5.657 MTPA coal and achieved annual PLF 76.80 %.*
- *Through different modes of power sales DBPL was able to sale total 7645.39 MUs in FY 20-21. DBPL supplied 4271.01 MUs under long term PPAs, 1783.4 MUs under short term bilateral PPAs and 1653.46 MUs through IEX/ merchant power sale.*
- *DBPL declared availability for the TANGEDCO PPA was 94.91 % and for Rajasthan DISCOMs PPA was 86.30 %. Declared Long term PPA availability was above the normative availability of 85 % as per PPA norms enabling full capacity charge recovery applicable to long term PPAs.*
- *Currently DBPL has long term PPA tie up of 51% of the total installed plant capacity.*
- *DBPL needs to enter into long term FSA for the required balance quantity of coal to ensure sustainable operation of the plant.*
- *Water drawl agreement is in place and DBPL has built the complete river water intake system for drawing water for the power plant usage. DBPL raw water reservoir could cater to the requirement of the plant for about 15 days considering full load operation of both units.*
- *To ensure year-round availability of water to the Project, GoCG has constructed a weir (Kalma Barrage) on the Mahanadi River, where the adequate quantity of water is stored. Storage capacity of 50 MCM is more than allocated water quantity of 30 MCM.*

Discussion with plant people revealed that water shortage has not been experienced for plant operation till date.

- *As per Environment Clearance, DBPL need to ensure 100% fly ash utilization from 4th year onwards. During FY 2020-21 total ash (fly ash + bottom ash) utilization achieved has been around 98.30 % as per the data shared by company.*
- *Irrespective of the demand –supply mismatch issue in Chhattisgarh state, DBPL has improved substantially from previous year's ash utilization of 84%.*
- *Upon implementation of the submitted plan for ash utilization, the existing ash dyke will be sufficient. However, LIE opines that DBPL shall maintain sufficient empty capacity in existing Ash Dyke-1 all the time to accommodate the ash generated during daily operations in case of short lifting by Cement plants and non-availability of ash dumping avenues. DBPL shall continue to explore more avenues for 100 % ash utilization.*
- *DBPL has been exploring to utilize fly ash utilization in abundant mines, in few cases DBPL has received the permissions also.*
- *Two (02) no. of Transmission Towers are installed inside the ash dyke (Lagoon-1). DBPL has to maintain the minimum clearance of 8.84 m between bottom conductor and ground for 400 kV transmission line as per Indian Electricity Rule 1956, Clause No.77. Also DBPL has to ensure structure stability of transmission tower, maintenance considerations and maintain the safe clearance between conductor & ground with increase in bund height. DBPL has informed that, DBPL has considered this minimum height requirement during ash dyke height raise. After 2nd height raise of lagoon-1, a clearance of 11 m from top of fully filled Lagoon-1 is maintained. DBPL will not further increase height of lagoon-1. If needed lagoon-2 height will be raised. During 2nd raise of height and ash emptying work of Lagoon-1, dyke boundary bund is formed in such a way, to take one tower outside the dyke bund. Anti-corrosive paint has been applied on submerged structure of the second tower for protection. LIE opines that DBPL should take necessary action for the structural stability of both the towers.*

3.0 REVIEW OF O&M REGIME

3.1 Review of Plant Performance

Since COD the Units are operational as per demand. Plant performance of both the Units for the FY 2020-2021 is summarized below.

Table: UNIT-1 Operation Performance

Sr. No.	Particulars	FY 20-21	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21
1	Gross Generation (MUs)	**4023.39**	384.29	305.682	328.653	325.671	293.557	294.708	209.007	338.286	368.53	372.408	361.678	440.92
2	Export (MUs)	**3811.72**	362.75	289.16	310.65	307.40	277.12	279.29	197.70	320.91	350.39	353.11	344.33	418.91
3	U#1 On-Grid Availability- PAF (%)	**91.29**	100.0	91.0	95.2	94.6	94.6	88.0	58.5	92.5	94.4	93.6	93.7	100.0
4	U#1 PLF (%)	**76.55**	88.96	68.48	76.08	72.95	65.76	68.22	46.82	78.31	82.56	83.42	89.70	98.77
5	Auxiliary Power Consumption (%)	**5.26**	5.60	5.40	5.48	5.61	5.60	5.23	5.41	5.14	4.92	5.18	4.80	4.99
6	Auxiliary Power Consumption (MU)	**211.67**	21.54	16.52	18.00	18.27	16.44	15.41	11.31	17.38	18.14	19.30	17.35	22.01
7	Turbine Heat Rate (kCal / kWh)	**1999**	2004	2030	2012	2020	2046	2030	2006	1986	1978	1982	1963	1960
8	Boiler Efficiency (%)	**86.95**	87.45	87.41	87.15	86.83	86.97	87.31	87.03	86.74	86.73	86.67	86.71	86.59
9	Heat Rate (kCal /kWh)-Indirect	**2298.02**	2292	2322	2309	2326	2353	2325	2305	2290	2281	2287	2264	2264
10	Coal Consumption (Tonne)	**2893519**	267400	208930	242445	256610	228839	210017	157688	242989	258279	257408	250654	312260
11	Coal GCV (Kcal/Kg)	**3172**	3251	3444	3122	2942	3028	3240	3054	3151	3182	3232	3247	3166
12	Secondary Fuel Oil Consumption (kL)	**1035.28**	0	67	76	58.7	63.5	99.28	224	82.17	80	213.63	71	0
	Sp. Fuel Oil Consumption (ml/kWh)	**0.26**	0	0.22	0.23	0.18	0.22	0.34	1.07	0.24	0.22	0.57	0.20	0
13	Raw Water Consumption (m3)	**8516762**	811096	649286	677750	659892	604896	593950	440740	637671	713263	861678	822479	1044062
14	DM Water Consumption (Tonne)	**70729**	7807	6251	5796	5162	4862	4950	3526	5566	6174	7381	6673	6581
	U-1 DM Water Make-up (%)	**0.45**	0.55	0.47	0.43	0.38	0.35	0.4	0.42	0.43	0.45	0.54	0.54	0.45
15	Planned Outage (hrs)	**0**	0	0	0	0	0	0	0	0	0	0	0	0
16	Forced Outage (hrs)	**764.5**	0	66.96	34.92	40.23	39.9	86.28	309.13	53.68	41.85	48.95	42.55	0
17	Reserved Outage (hrs)	**0**	0	0	0	0	0	0	0	0	0	0	0	0
18	**Emission Details**													
	SOx (mg/Nm^3)	**1242**	1258	1150	1286	1438	1251	1066	1201	1357	1305	1223	1130	1234
	NOx (mg/Nm^3)	**402**	410	388	400	414	393	345	430	418	409	411	345	465
	SPM (mg/Nm^3)	**39**	41.3	40.3	41.9	43.2	43.3	38.6	33.1	37.4	39.1	37.6	37.3	39.1
19	**Ash**													
	Production (Tonne)	**1315331**	122439	92592	106395	117539	100380	92075	74883	110710	118654	116431	115258	147975
	Utilization (Tonne)	**1294950**	121410	107591	90118	93314	91726	83502	72920	128717	105732	146135	129944	123841
	Stock (Tonne) - (Silo)		Common silo for both units											
20	No. of Start Ups	**15**	0	1	1	1	1	1	3	1	2	3	1	0

Source: DBPL

Table: UNIT-2 Operation Performance

Sr. No.	Particulars	FY 20-21	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21
1	Gross Generation (MUs)	**4049.94**	15.27	349.72	335.19	355.54	319.34	343.45	397.75	366.97	394.59	345.04	384.57	442.52
2	Export (MUs)	**3833.67**	14.42	330.43	316.87	335.31	301.11	324.90	374.43	347.70	374.79	327.52	365.79	420.41
3	U#2 On-Grid Availability -PAF (%)	**90.75**	4.97	99.55	97.22	100.00	100.00	100.00	100.00	98.91	100.00	87.21	100.00	100.00
4	U#2 PLF (%)	**77.05**	3.53	78.34	77.59	79.65	71.54	79.50	89.10	84.95	88.39	77.29	95.38	99.13
5	Auxiliary Power Consumption (%)	**5.34**	5.52	5.52	5.47	5.69	5.71	5.40	5.86	5.25	5.02	5.08	4.88	5.00
6	Auxiliary Power Consumption (MUs)	**216.28**	0.84	19.29	18.32	20.24	18.22	18.55	23.32	19.27	19.80	17.52	18.79	22.11
7	Turbine Heat Rate (kCal / kWh)	**2003**	2055	2017	2012	2018	2037	2025	1989	1999	1981	1981	1964	1962
8	Boiler Efficiency (%)	**87.26**	87.64	87.73	86.99	86.91	87.25	87.45	87.14	87.08	87.19	87.25	87.2	87.24
9	Heat Rate (kCal /kWh)-Indirect	**2290.3**	2345	2299	2313	2322	2335	2316	2283	2296	2272	2270	2252	2249
10	Coal Consumption (Tonne)	**2924711**	10,560	2,34,921	2,49,100	2,77,024	2,50,629	2,48,338	2,95,639	2,62,018	2,76,187	2,39,560	2,68,590	3,12,145
11	Coal GCV (Kcal/Kg)	**3155**	3287	3439	3119	2951	3021	3215	3040	3156	3184	3225	3226	3169
12	Secondary Fuel Oil Consumption (kL)	**485.5**	104.4	32	70	0	1.3	3	0	103.6	0	171.2	0	
	Sp. Fuel Oil Consumption (ml/kWh)	**0.12**	6.84	0.09	0.21	0.00	0.00	0.01	0.00	0.28	0.00	0.50	0.00	0.00
13	Raw Water Consumption (m3)	**8551822**	32219	742814	691235	720423	658015	692183	838749	691732	763706	798361	874543	1047841
14	DM Water Consumption (Tonne)	**64009**	597	4685	5304	5299	4604	5182	5262	6133	7092	7400	5666	6785
	U-2 DM Water Make-up (%)	**0.41**	0.85	0.32	0.39	0.36	0.32	0.37	0.36	0.44	0.49	0.58	0.43	0.47
15	Planned Outage (hrs)	**0**	0	0	0	0	0	0	0	0	0	0	0	0
16	Forced Outage (hrs)	**126.5**	0	3.35	20.05	0	0	0	0	7.87	0	95.18	0	0
17	Reserved Outage (hrs)	**684.25**	684.25	0	0	0	0	0	0	0	0	0	0	0
18	**Emission Details**													
	SOx (mg/Nm^3)	**1275**	1395	1351	1425	1336	1110	1281	1106	1219	1219	1269	1301	1282
	NOx (mg/Nm^3)	**412**	351	375	467	440	442	332	442	437	401	377	410	472
	SPM (mg/Nm^3)	**43**	42.2	41.2	41.1	42.5	43.5	43.3	43.1	42.8	42.6	42.3	42.7	42.8
19	**Ash**													
	Production (Tonne)	**1330403**	4835	104110	109315	126890	109938	108875	140393	119380	126881	108358	123506	147921
	Utilization (Tonne)	**1305911**	4795	120975	92592	100738	100461	98738	136712	138797	113063	136002	139243	123796
	Stock (Tonne) - (Silo)		Common silo for both units											
20	No. of Start Ups	**7**	1	1	1	0	0	0	0	2	0	2	0	0

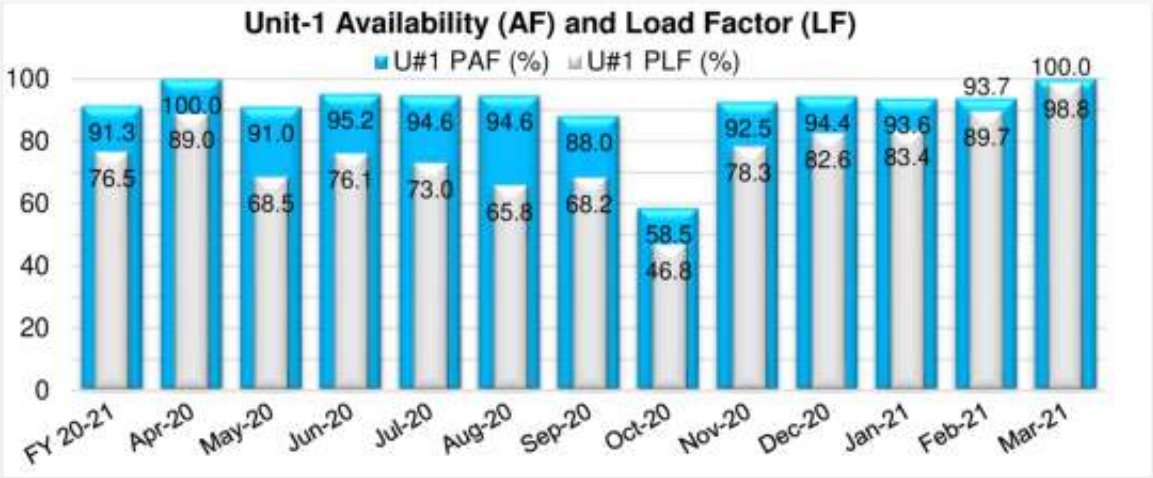
Source: DBPL

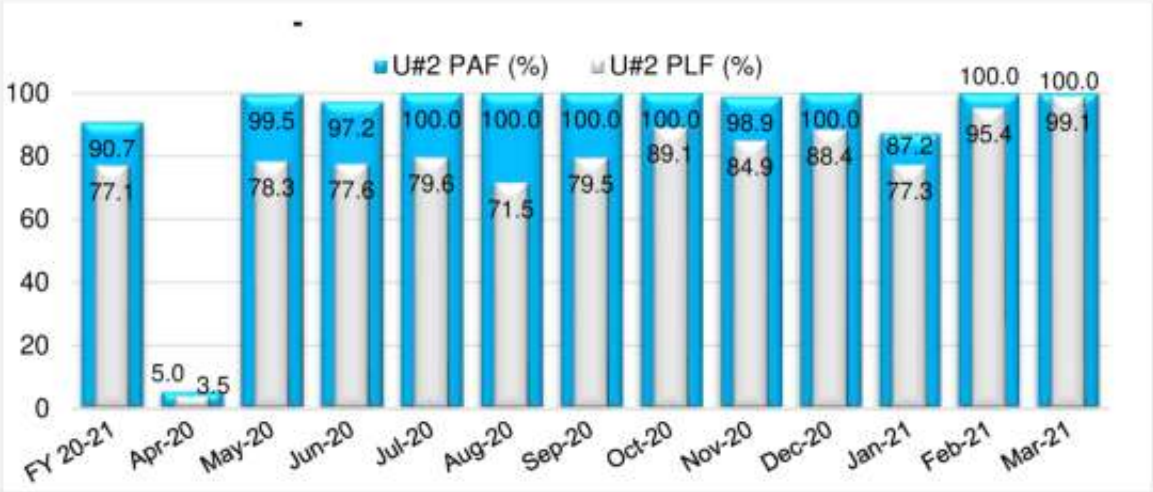
Table: Station Operation Performance (Cumulative of Unit-1 and Unit-2)

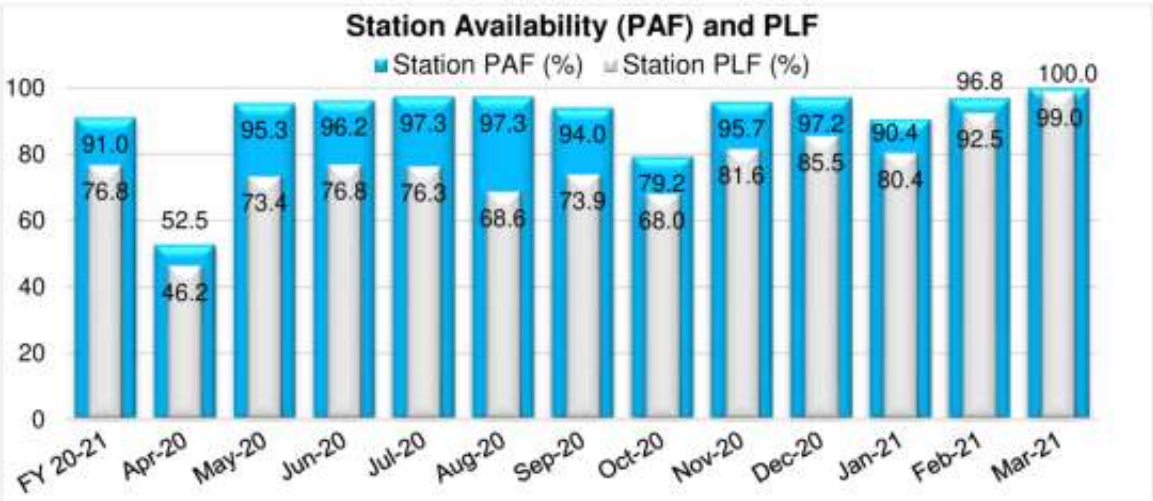
Sr. No.	Particulars	FY 20-21	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21
1	Gross Generation (MUs)	**8073.33**	399.56	655.40	663.85	681.22	612.89	638.16	606.76	705.25	763.12	717.45	746.25	883.44
2	Export (MUs)	**7645.39**	377.17	619.59	627.52	642.70	578.23	604.19	572.12	668.60	725.18	680.64	710.12	839.32
3	Station On-Grid Availability- PAF (%)	**91.02**	52.48	95.27	96.18	97.30	97.32	94.01	79.23	95.73	97.19	90.42	96.84	100.00
4	Station PLF (%)	**76.80**	46.24	73.41	76.83	76.30	68.65	73.86	67.96	81.63	85.48	80.36	92.54	98.95
5	Auxiliary Power Consumption-APC (%)	**5.30**	5.60	5.46	5.47	5.65	5.66	5.32	5.71	5.20	4.97	5.13	4.84	4.99
6	Station Auxiliary Power Consumption (MUs)	**427.95**	22.38	35.81	36.33	38.51	34.66	33.97	34.64	36.65	37.94	36.82	36.13	44.12
7	Turbine Heat Rate (kCal / kWh)	**2000**	2006	2023	2012	2019	2041	2027	1995	1993	1980	1982	1964	1961
8	Boiler Efficiency (%)	**87.11**	87.46	87.58	87.07	86.87	87.12	87.39	87.10	86.92	86.97	86.95	86.96	86.92
9	Station Heat Rate (kCal /kWh)-Indirect	**2296**	2294	2310	2311	2324	2343	2320	2290	2293	2276	2279	2258	2256
10	Coal Consumption (Tonne)	**5818230**	2,77,960	4,43,851	4,91,545	5,33,634	4,79,468	4,58,355	4,53,327	5,05,007	5,34,466	4,96,968	5,19,244	6,24,405
11	Coal GCV (Kcal/Kg)	**3163**	3252	3441	3121	2947	3024	3226	3045	3154	3183	3229	3236	3167
12	Secondary Fuel Oil Consumption (kL)	**1520.78**	104.4	99	146	58.7	64.8	102.28	224	185.77	80	384.83	71	0
	Sp. Fuel Oil Consumption (ml/kWh)	**0.19**	0.26	0.15	0.22	0.09	0.11	0.16	0.37	0.26	0.10	0.54	0.10	0
13	Raw Water Consumption (m3)	**17068584**	843315	1392100	1368985	1380315	1262911	1286133	1279489	1329403	1476969	1660039	1697022	2091903
	Sp. Raw Water Consumption (m3/MWh)	**2.11**	2.11	2.12	2.06	2.03	2.06	2.02	2.11	1.89	1.94	2.31	2.27	2.37
14	DM Water Consumption (Tonne)	**134738**	8404	10936	11100	10461	9466	10132	8788	11699	13266	14781	12339	13366
15	Planned Outage (hrs)	**0**	0	0	0	0	0	0	0	0	0	0	0	0
16	Forced Outage (hrs)	**890.9**	0	70.31	54.97	40.23	39.9	86.28	309.13	61.55	41.85	144.13	42.5	0
17	Reserved Outage (hrs)	**684.25**	684.25	0	0	0	0	0	0	0	0	0	0	0
18	**Emission Details**													
	Sox (mg/Nm^3)	**1258**	1327	1251	1356	1387	1181	1174	1154	1288	1262	1246	1216	1258
	NOx (mg/Nm^3)	**407**	381	382	434	427	418	339	436	428	405	394	378	469
	SPM (mg/Nm^3)	**41**	42	41	42	43	43	41	38	40	41	40	40	41
19	**Ash**													
	Production (Tonne)	**2645733**	127274	196702	215710	244429	210319	200950	215276	230091	245535	224788	238764	295896
	Utilization (Tonne)	**2600862**	126204	228566	182710	194052	192187	182240	209632	267514	218796	282137	269187	247637
	Stock (Tonne) - (Silo)	**3940**	2665	3517	4477	3677	4157	4157	2505	4317	3997.5	4743.7	4370.6	4690.4
20	**Fuel Stock**													
	Secondary Fuel Oil (kL)	**608**	659	844	848	789	724	622	398	412	440	366	575	608
	Coal Stock (Tonne)	**126712**	333403	172308	182955	62528	85528	109797	191277	269009	269478	364862	248657	126712
21	No. of Start Ups	22	2	2	2	1	1	1	3	3	2	5	1	0

Source: DBPL

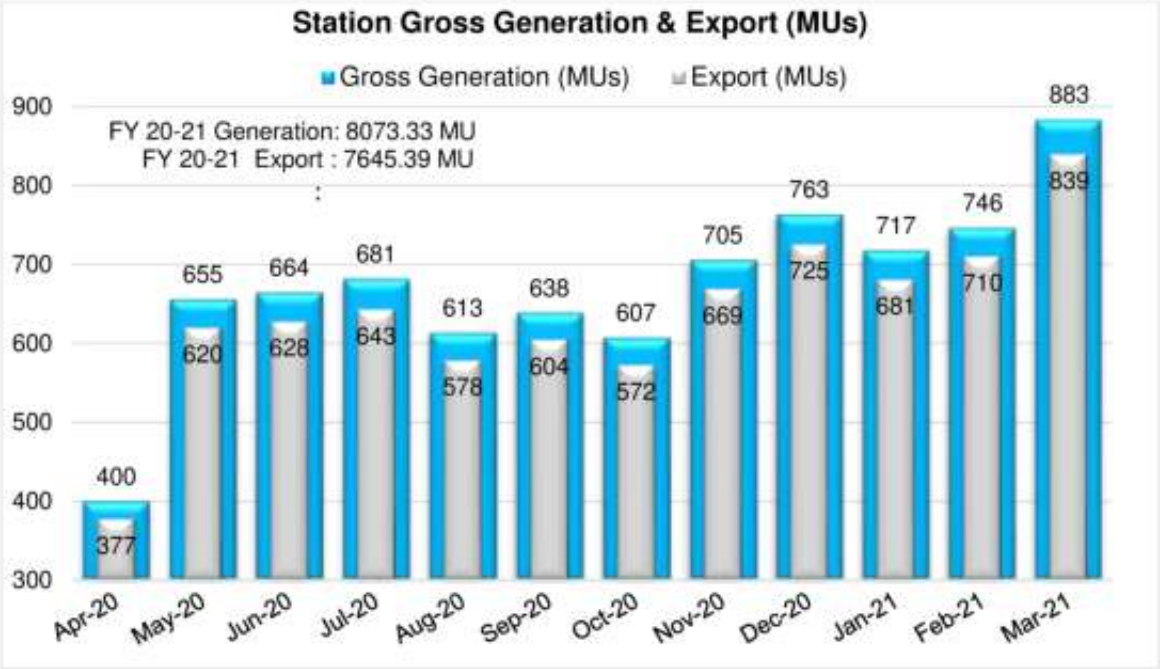
Monthly & Yearly PLF and Availability Factor (AF) during the FY20-21 of Unit-1, Unit-2 and Cumulative of Station are represented in a charts below:



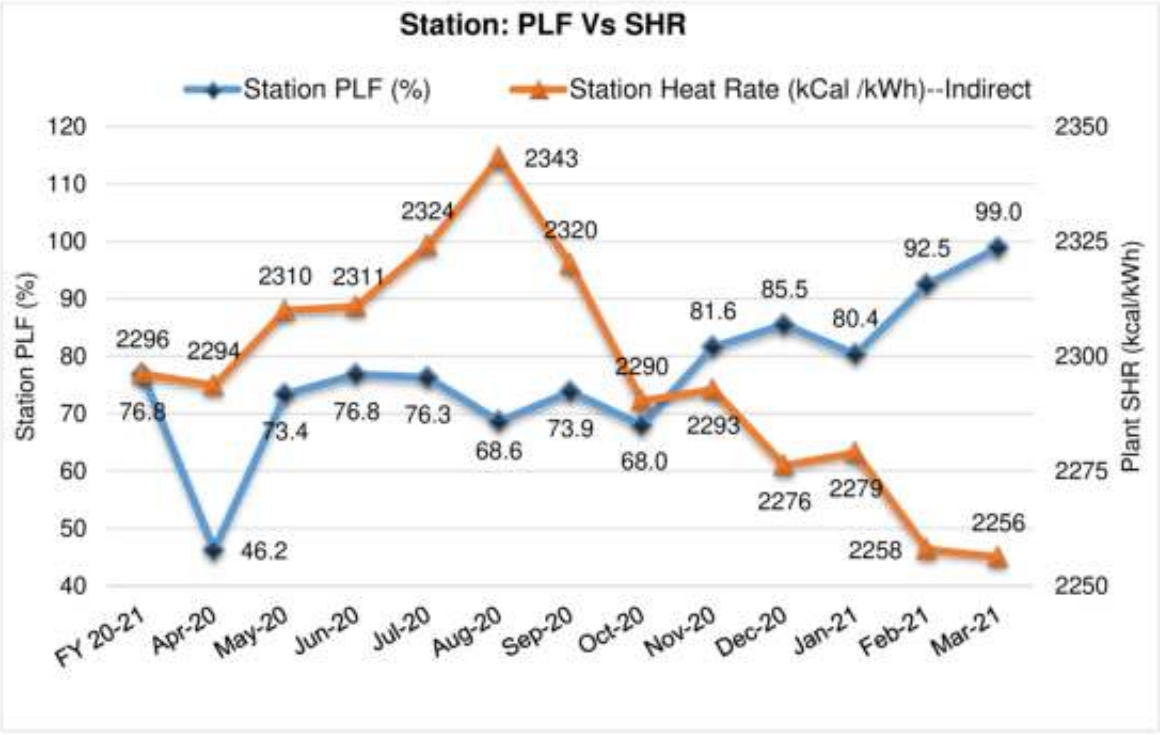




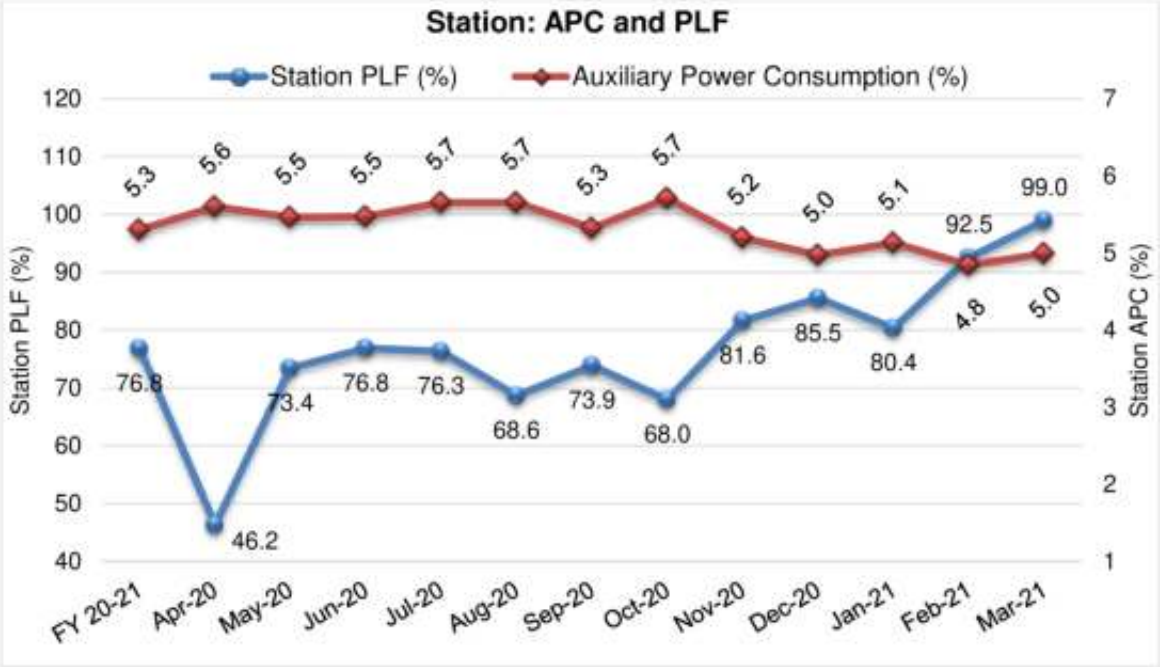
Monthly Generation and Export during the FY20-21 of Station are represented in a chart below:



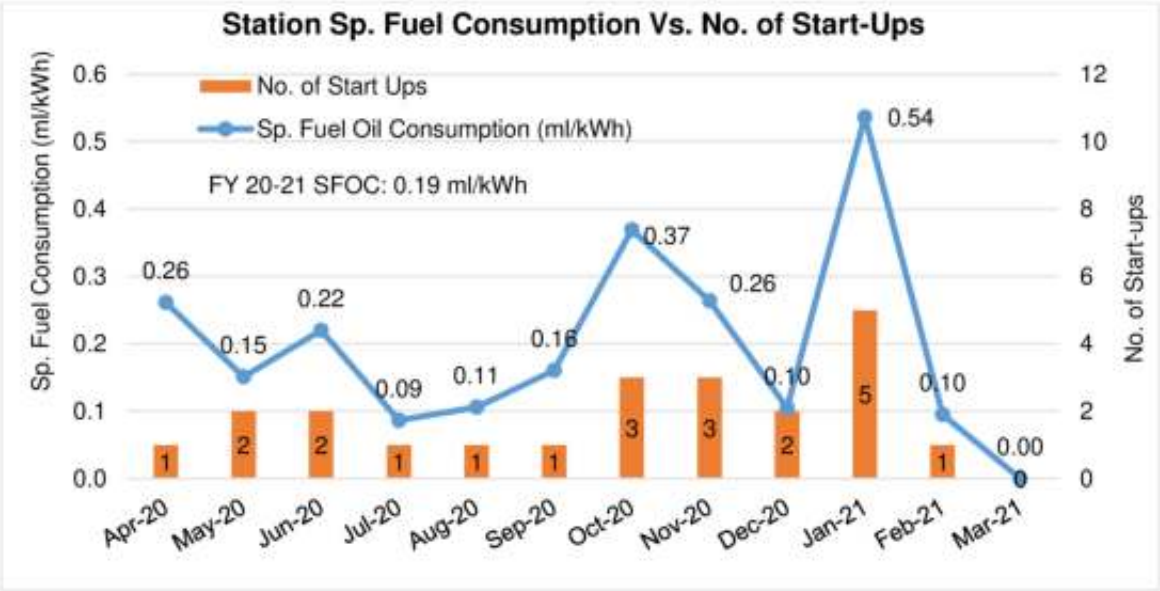
Monthly and yearly Station Heat Rate (SHR) Vs PLF (%) during the FY20-21 are represented in a chart below:



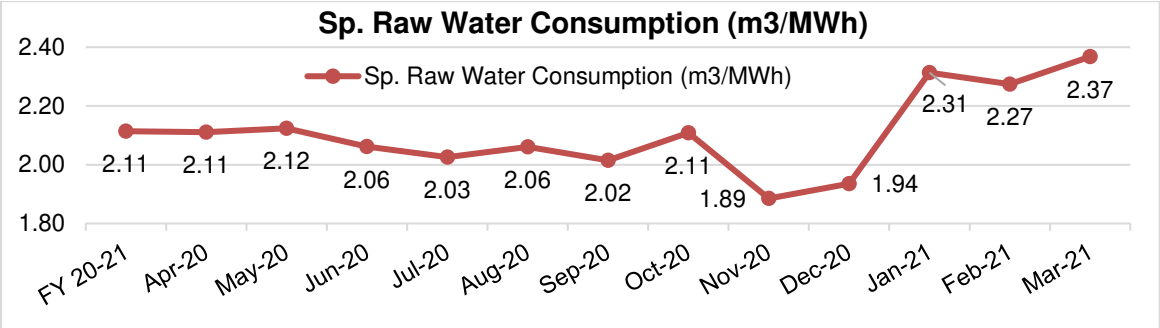
Monthly and yearly Station APC (%) and PLF (%) during the FY20-21 are represented in a chart below:



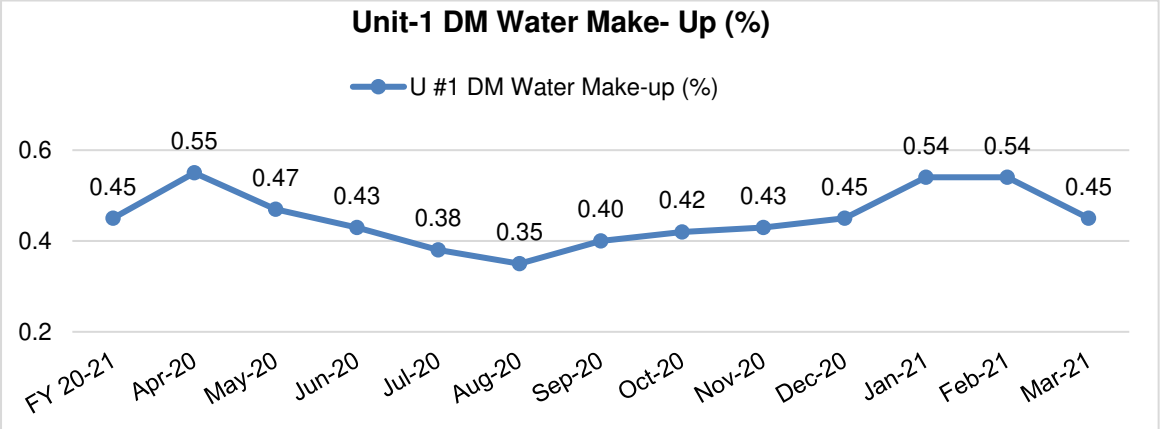
Month wise Specific Fuel Oil Consumption (SFOC) and Nos. of start-up in a month faced by the power station during the FY20-21 are depicted below:

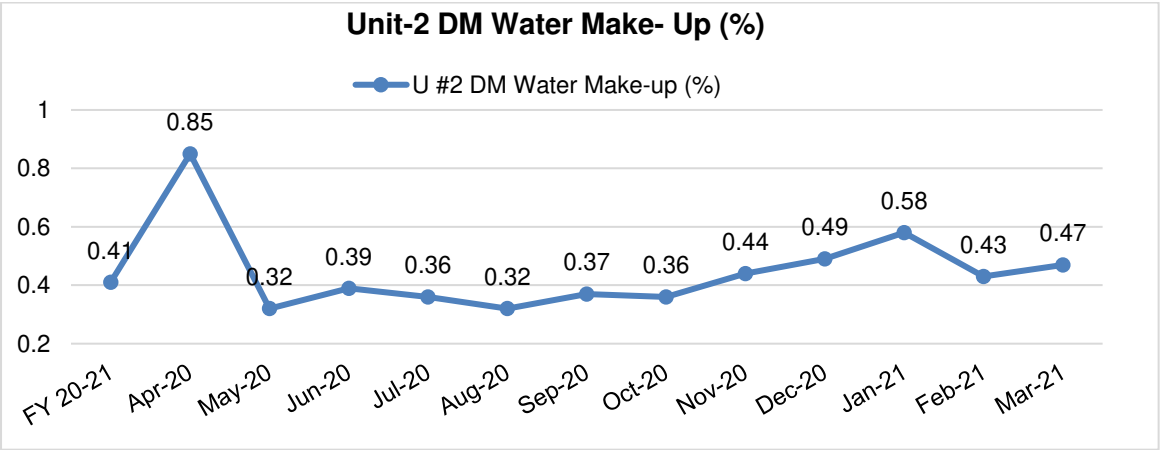


Month wise and yearly specific raw water consumption during the FY20-21 is represented for station in the following charts:



Month wise and yearly DM water make up (%) during the FY20-21 is represented unit wise in the following charts:





LE's Observations/Comments

- *On grid availability (AF) of the Unit-1 was 91.3 % and of Unit-2 was 90.7 % while cumulative station on grid availability stood at 91.02 %.*
- *Unit-1 & 2 Forced outages were 8.7% & 1.4 % and Planned Outage for maintenance were 0 % for both Units. Accordingly technical availability of individual units were 91.3 % and 98.6 %.*
- *Load Factor (LF) of the Unit-1 stood at 76.55 % Vs 59.98 % a year ago, Unit-2 LF was 77.05 % Vs 62.19 % a year ago, with the overall PLF for the station at 76.80 % Vs 61.09 % a year ago. Highest monthly LF for Unit-1 was 98.77 % and that of Unit-2 was 99.13 % both achieved in Mar'21. Highest monthly station PLF was 98.95 % in Mar'21. DBPL has achieved a better PLF than national average PLF for Coal & Lignite based power plants (National average PLF for FY21 was 53.37 %).*
- *Unit-1 on-grid availability (AF) was low during month of Oct'20 due to the forced outage caused by Turbine trip on over speed trip device malfunctioning. Low availability caused the Lower LF for this month.*
- *Unit-2 on-grid availability (AF) was low during month of April'20 due to reserved shutdown (as sufficient power selling schedule was not available to run both the Units), this resulted in Lower LF of Unit-2 during the month. During Aug'20 although station availability was high, lower power selling schedules lowered the PLF.*
- *Unit's technical availability is on par with industrial average.*
- *It is DBPL's standard practice to operate the unit at full load every month for performance testing purpose. Also, DBPL periodically conducts tests and reviews the performance of the critical equipment like condenser performance, turbine cylinder efficiency, APH performance, feed water heater performance, etc. to analyze the thermal performance and efficiency gap.*
- *Yearly average operational heat rate (HR) of Unit-1 is 2298 kCal/kWh and Unit-2 is 2290 kCal/kWh, which is higher than the Design heat rate of 2252 kCal/kWh by 46 kCal/kWh and 38 kCal/kWh. However, this HR deterioration over the design HR is well within the CERC normative HR margin of 5 %. Higher heat rate than design is mainly due to variation in operating conditions than design. During Feb'21 and March'21, Heat*

Rate of the station (both Units combined) was 2258 and 2256 kCal/kWh when Station PLF was 92.5 % and 99 % respectively.

- *Unit-1 Monthly HR has remained between min. 2264 (in March'21, LF 98.8 %) to Max. 2353 (in August'21, LF 68.2 %) kCal/kWh. Unit-2 Monthly HR has remained between min. 2249 (in March'21, LF 99.1 %) to Max. 2345 (in April'20, LF 3.5 %) kCal / kWh.*
- *Yearly Auxiliary Power Consumption (APC) is 5.3 % at 76.8 % PLF which is slightly higher than recommended value by CERC i.e. 5.25 %. The higher APC could be attributed to unit operations at part load. Monthly Station APC was below 5.25 % during November'20 to March'21 at higher loading (LF 81.6 % to 99 %)*
- *DBPL has conducted energy audit for energy conservation on 18th Feb'19 to 26th Feb'19. DBPL is taking continuous efforts and implementing the feasible recommendations for energy conservation as per the audit and in-house analysis.*
- *As informed by DBPL, through the continued efforts, DBPL has achieved lowest ever monthly APC of 4.8 % (at ~92.5 % PLF) during Feb'21 and lowest ever day APC of 4.55 % (at ~96 % PLF) on 7th February, 2021. Since COD, yearly APC is in a gradually decreasing trend. DBPL shall continue the efforts to consistently achieve lower average yearly APC.*
- *Specific secondary fuel oil consumption (SFOC) of 0.19 ml/kWh is reported during FY 20-21. SFOC is depends on the nos. of start-up & type of start-up and requirement of fuel oil at lower loads. During January'21 SFOC was 0.54 ml/kWh due to the higher nos. (5 No.) of start-ups (3 warm start-ups and 2 Hot start-ups). DBPL has maintained a good control over secondary fuel oil consumption.*
- *Unit-1 DM water make-up was 0.45 % and of Unit-2 was 0.41 %. Though, average value is near to the industry practice, monthly trend of DM water make-up is in increasing trend over the FY 20-21 for both the Units. DBPL shall take actions to rectify the water-steam cycle isolation/ leakages.*
- *Specific Raw water consumption during FY 20-21 was 2.11 m^3/MWh. It is well below the prescribed limit i.e. 3.50 m^3/MWh as per new environmental norms published in 7th Dec 2015 notification.*
- *DBPL periodically conducts noise monitoring using Sound Level Meter for work environment and measures near field noise (1 meter away from the respective*

sources). The reported values at different sources/ machines are below the CECB norm.

- *The latest Environment Compliance report submitted to the MoEF indicates that the Ambient Air Quality monitoring data's (PM, SO_2, NOx, CO) are all within the permissible limits.*
- *Along with online CEMS, DBPL also conducts 3rd party offline flue gas emission monitoring periodically.*
- *Stack Emission Monitoring Reports (third party) of Unit-1 & 2 shows NOx emission remains slightly higher (444 to 482 mg/Nm3) than the revised prescribed limit i.e. 450 mg/Nm3. In view of revised norms for NOx, BDPL shall reinitiate talk with BHEL for implementation of NOx abatement requirements.*
- *Stack Emission Monitoring Report (3rd party) of Unit-1 & 2 also shows that SOx emission remains between 1386-1524 mg/Nm^3, which is higher than the prescribed limit i.e. 200 mg/Nm^3 as per new environmental norms published on 7th Dec 2015 notification. To comply with the norms DBPL is in process of installing the FGD system.*
- *DBPL has appointed M/s. Black & Veatch as consultant for installation of FGD. The consultant has recommended Wet FGD as suited technology for meeting SO_2 limits and Installation of OFA with Low NOx burners (LNB) for meeting NOx limits*
- *As per the earlier released phase plan by CEA for installation of FGDs– DBPL Unit-2 was required to be installed FGD by 30.09.2020 and Unit-1 by 30.06.2021. Accordingly, DBPL signed off EPC contract for FGD system with Chinese EPC contractor M/s TUNA corporation in September 2019. Site mobilization was planned to commence from 1st Quarter 2020 but due to spreading of Covid-19 and other reasons, FGD project got delayed. In view of the same DBPL has given written communication to CPCB and CEA and sought a time extension of 02 years.*
- *DBPL has given latest status of FGD to CEA via letter no. DBPL/CEA/FGD/ 15102020 dtd. 15.10.2020*
- *As per MoP office memorandum dtd. 20.01.2021, on account of uncertainties/ delays due to COVID-19 pandemic and on account of other issues like import restrictions, minimum local component condition under Atma Nirbhar Bharat, liquidity crunch in power sector, credit refusals due to high stress in power sector, regulatory delays etc.,*

an extension of 02 years to the existing CPCB time line is considered for the 448 operational power plants. According to the list revised dates for installation of FGD for DBPL units are mentioned as :

U#1- June 2023 & U#2-Sept. 2022

- *On 08 January 2021, DBPL & M/s. TUNA Signed off amendment-01 to offshore supply contract agreement, along with some technical amendments ZERO date of contact is also amended to 1st Oct' 2021. Accordingly commissioning are scheduled as: Unit-1 June 2022 and Unit-2 Sept. 2022.*
- *As per agreed schedule between DBPL and M/s TUNA, DBPL will be able to meet the revised deadline given by CEA for FGD.*

3.2 Review of Outages

The outages of the Unit-1 have been summarized in a table below:

Table: Outages- Unit #1:

Event No.	Trip Date and Time	Reason	Sync Date and Time	Outage Hrs	Outage Type
1	04-May-2020 22:15 hrs	BTL in water wall front S panel.	07-May-2020 17:13 hrs	66.96	FORCED (BTL)
2	08-Jun-2020 23:58 hrs	Vibration problem in BCW pump.	10-Jun-2020 10:53 hrs	34.92	FORCED
3	18-Jul-2020 09:08 hrs	Shaft Vibration probe 1X replacement	20-Jul-2020 01:22 hrs	40.23	FORCED
4	02-Aug-2020 00:55 hrs	Hot secondary air leakage from duct.	03-Aug-2020 16:49 hrs	39.90	FORCED
5	18-Sep-2020 19:36 hrs	Main Turbine IPSV stuck up.	22-Sep-2020 09:53 hrs	86.28	FORCED
6	16-Oct-2020 01:18 hrs	LHS HPSV (ESV-1) Closed	17-Oct-2020 09:22 hrs	32.07	FORCED
7	17-Oct-2020 09:41 hrs	Turbine tripped on IP diff temp high	17-Oct-2020 10:20 hrs	0.65	FORCED
8	17-Oct-2020 12:30 hrs	Turbine tripped on over speed trip release (OSTR) device malfunctioning	29-Oct-2020 00:55 hrs	276.42	FORCED
9	02-Nov-2020 02:59 hrs	Clinker at +8.5 near S-panel	04-Nov-2020 08:40 hrs	53.68	FORCED
10	18-Dec-2020 17:41 hrs	Superheater spray control valve problem.	20-Dec-2020 10:12 hrs	40.52	FORCED
11	20-Dec-2020 10:58 hrs	Turbine tripped on Condenser VSP protection acted	20-Dec-2020 12:18 hrs	1.33	FORCED
12	07-Jan-2021 10:59 hrs	Both HPSV (ESV-1 & 2) closure	09-Jan-2021 06:22 hrs	43.37	FORCED
13	09-Jan-2021 10:43 hrs	Generator elect tripped (DCDB board earth fault testing kit fault)	09-Jan-2021 12:19 hrs	1.60	FORCED
14	12-Jan-2021 08:39 hrs	Generator elect tripped (DG trial)	12-Jan-2021 12:38 hrs	3.98	FORCED
15	18-Feb-2021 09:03 hrs	BTL Back pass screen tube 66 mtr elevation	20-Feb-2021 03:36 hrs	42.55	FORCED (BTL)

Source: DBPL

Table: Outages categories- Unit #1:

UNIT-1	Planned Outage	Forced Outage	Reserve Outage *	Plant Availability	Total Outage
Hours	0.0	764.5	0.0	7995.5	764.5
%	0.0	8.7	0.0	91.3	8.7

** Reserve Outage:* Unit was not operational due to issues other than technical

Source: DBPL

The outages of the Unit-2 have been summarized in a table below.

Table: Outages- Unit #2:

Event No.	Trip Date	Reason	Sync Date	Outage Hrs	Outage Type
	Previous FY (31.03.2020, 15:28:00 hrs)	APH gear box high vibration, continued in reserve SD	28-04-2020 12:25 hrs	684.25	RESERVE
1	06-May-2020 10:42 hrs	Generator elect. Protection - R phase PT clamp found loose at primary side.	06-May-2020 14:03 hrs	3.35	FORCED
2	19-Jun-2020 00:15 hrs	Boiler Misc. (Drum Safety Valve Passing Problem)	19-Jun-2020 20:18 hrs	20.05	FORCED
3	23-Nov-2020 03:45 hrs	Unit-2 tripped on flame failure	23-Nov-2020 08:39 hrs	4.90	FORCED
4	30-Nov-2020 06:15 hrs	Unit-2 tripped on flame failure	30-Nov-2020 09:13 hrs	2.97	FORCED
5	17-Jan-2021 02:48 hrs	Abnormal sound in APH-2B	18-Jan-2021 14:38 hrs	35.83	FORCED
6	19-Jan-2021 23:18 hrs	Drum Safety Valve passing Problem	22-Jan-2021 10:39 hrs	59.35	FORCED

Source: DBPL

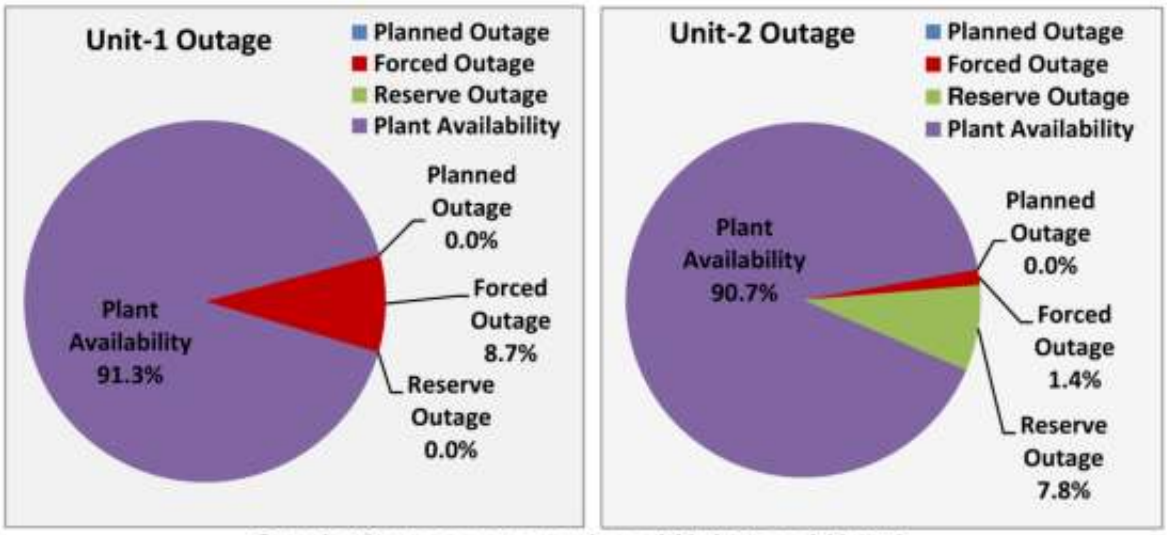
Table: Outages categories- Unit #2:

UNIT-2	Planned Outage	Forced Outage	Reserve Outage *	Plant Availability	Total Outage
Hours	0.000	126.450	684.250	7949.300	810.700
%	0.0	1.4	7.8	90.7	9.3

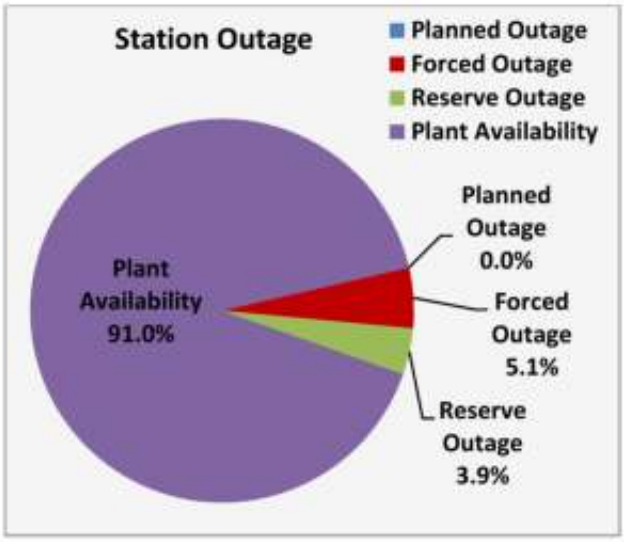
** Reserve Outage:* Unit was not operational due to issues other than technical

Source: DBPL

The plant forced, planned and reserved outages are reviewed. The same has been categorised and plotted below:

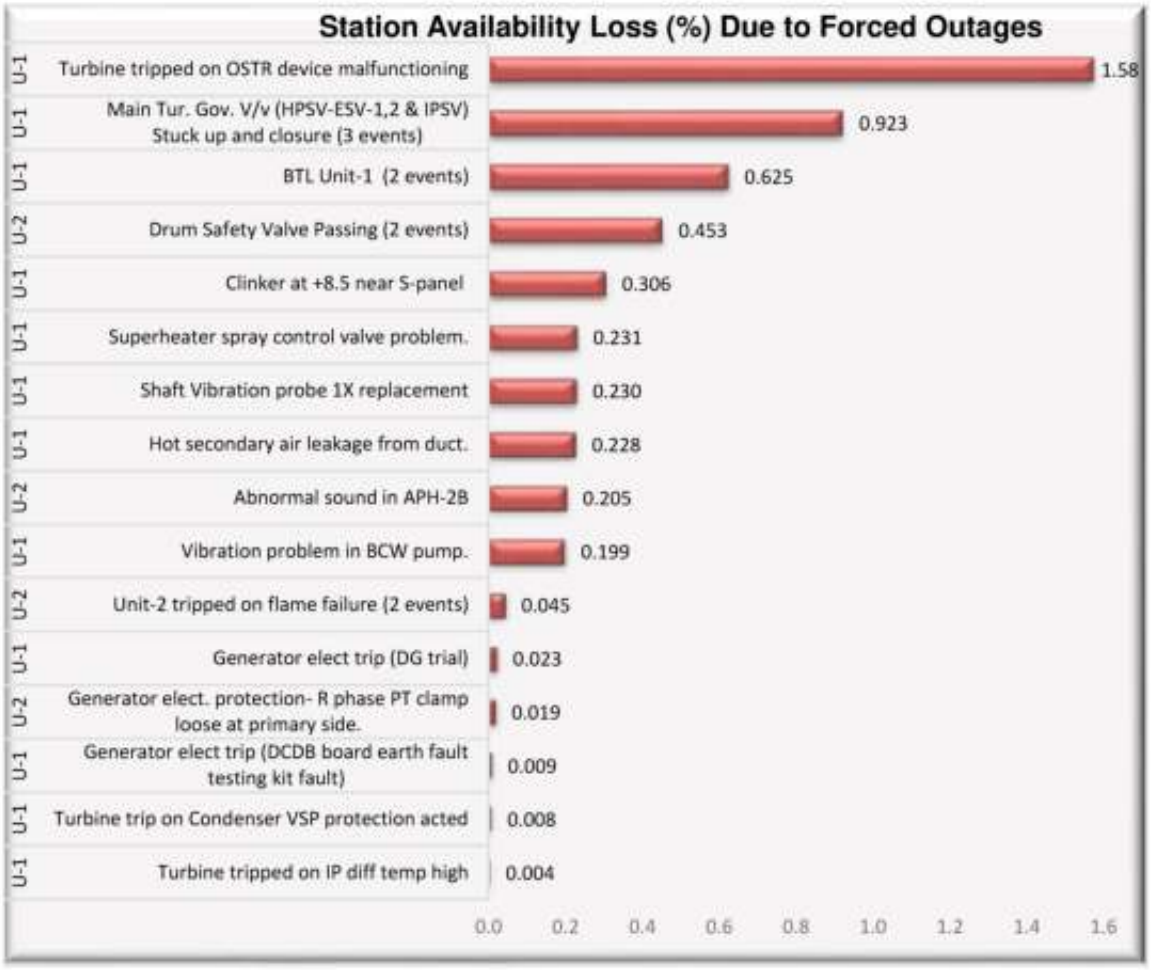


Graph: Outages categories of Unit-1 and Unit-2



Graph: Outages categories cumulative for Station

Reasons of the Forced Outages and Availability loss (%) due to the outage are depicted in the chart below:



LE's Observations/Comments

- *During FY 20-21, Unit-2 recorded longest ever continuous operation period of 156 days from 19th Jun'20 to 22nd Nov'20 since COD.*
- *Cumulative outage hours for Unit-1 were 764.5 hrs. (~31.85 days, 8.7 %) due to forced shutdown and for Unit-2 were 810.7 hrs. (~33.78 days, 9.3 %) due to reserved and forced shutdown.*
- *There was no Planned Outage for both the units during FY21.*
- *Unit-2 was in reserve shutdown for 684.25 hrs (~28.51 days, 7.8 %) in FY due to non-availability of sufficient power sale arrangement to operate both Units during April'20.*
- *Unit-1 was not in reserve shutdown anytime during FY.*
- *Cumulative forced outage time of Unit-1 was 764.5 hours i.e. ~31.85 days (8.7 %) and for Unit-2 was 126.45 hours or ~5.27 days (1.4 %).*
- *Unit-1 had Boiler tube leakage (BTL) for 02 times in FY 20-21. Unit-2 didn't have any BTL in FY 20-21. Since last AOH in August'20 Unit-2 hasn't had BTL till end of FY 20-21.*
- *DBPL is advised to carry out Root Cause Analysis of each BTL and take suitable corrective action to reduce it further.*
- *Unit-1 was frequently tripped (4 times) due to the problem in the turbine governing system devices like HP Turbine Stop Valve (HPSV-ESV), IP Turbine SV (IPSV), Over Speed Trip Release (OSTR) device. DBPL is suggested to carry out complete overhaul maintenance of the governing devices in next AOH/COH.*
- *Investigation and occurrence analysis of the all major incidents, failure of equipment etc. to find the root cause is carried out by the concerned departments. These records are maintained and suggested corrective actions are followed to avoid recurrence.*

3.3 Review of O&M Practices

The operation of the Plant is being undertaken by DBPL in-house. Plant maintenance activities have been undertaken through sub-contractors under DBPL supervision. A team of around 491 people conversant with Operation & Maintenance and Administration have been engaged.

Key Site Administration and O&M organization is given in a table below:

Table: Key Site Administration and O&M organization:

Sl. No.	Department/ Activity	No. of Employee	Department/ Function Head
1	Plant Head	-	B.S. Prasad
2	Head Maintenance	-	Naresh Panjabi
3	Operations	83	Mr. Abhinav Prakash Trivedi
4	Mechanical Maintenance	30	Mr. Deepak Kumar Sharma & Mr. Rajesh Kumar Singh
5	AHP	49	Mr. Deepak Kumar Sharma
6	CHP & Rail Siding	74	Mr. Gandharba Sahoo & Mr. MBS Sarma
7	C & I and IT	40	Mr. G.S. Santra
8	DM Plant	22	Mr. Abhinav Prakash Trivedi
9	Electrical	33	Mr. Kapil Dev Dubey
10	MTPP & Operations Efficiency	4	Mr. Abhinav Prakash Trivedi
11	Power Sales / Scheduling	4	Mr. Manu Namboothiri
12	Health & Safety	8	Dr. Anshul Pandey
13	FGD Project	2	Rajesh Kumar Singh
14	Administration and other	144	Mr. Hari Om Gupta, Mr, Sumit Chakraborthy, Mr. Ravi Kumar, Mr. Rajeev Chaturvedi, Mr. Aarun Rawat, Mr. Animesh De, Mr. Mausum Sinha, Mr. Dilip Acharya, Mr. Manoj Kumar Panda

Source: DBPL

DBPL has informed that the above manpower is available on continuous basis. Based on the requirement DBPL also engages additional man power through contracts for specified time period. DBPL's in house staff is directing and supervising the contractor staff for various operation & maintenance activities and the ultimate responsibility of maintaining the performance parameters like heat rate, auxiliary power consumption, oil consumption etc. lies with DBPL. DBPL also informed that OEM is providing supervision / experts services for maintenance activities of critical equipment.

DBPL has been carrying out the Maintenance of plant with support of the below listed sub-contractors and in-house team:

Table: O&M Support and Services Sub-contractors:

S. No.	Area	Sub-contractors
1	Boiler	M/s. Precision Erectors
2	Turbine & Generator	M/s. Bimcon Associates,
3	AHP	M/s. Premier Plant Services & Engineers Pvt. Ltd.
4	CHP	M/s. Premier Universal Venture Pvt Ltd,
5	Water system (pretreatment & DM plant)	M/s. Ram Enterprises & Thermax Ltd.
6	Electrical	M/s. Govind Construction
7	Condition monitoring	M/s. DBPL In-house
8	C&I	M/s. DBPL In-house
9	Housekeeping	M/s. Met life & M/s Nursing Patel & M/s. Ragho Engineering
10	Railway siding	M/s. Ultra Rail
11	Rail unloading system	M/s. T.M.P. Construction
12	Fie Services	M/s. Skshar Fire & Safety Services
13	Coal Sampling Preparation & Analysis	M/s. Therapeutic Chemical Research Corporation,
14	Plant Security Services	M/s. Morpheus Security Pvt. Ltd.

Source: DBPL

3.4 Defect Management System

Operational Defects:

Operation engineers raise defects on daily basis based on operational issues. The Maintenance Planning Engineer communicates the same to various maintenance departments. The same has been recorded and controlled through SAP.

Preventive Maintenance:

Maintenance department prepare Preventive Maintenance (PM) schedule as per OEM guidelines of equipment and the same is executed on regular basis. On discussion with the Plant Team and reviewing the availability records, DBPL has proper planning of annul PM schedule and the same has been reviewed and controlled through SAP on monthly basis.

3.5 Overhauling

No major overall was scheduled for FY 2020-2021

3.6 Review of Fire & Safety

Lead indicators related to the Fire & safety for FY 20-21 are tabulated below:

Table: Fire & Safety Lead Indicators:

Performance Parameters	FY 20-21	
	Target	Actual
Total Safe man-hours worked in Lacs.	-	29.9
Lost Time Injury Frequency Rate (LTIFR)	0	0
No. of Cross Functional safety Audit Conducted	24	24
No. of Mock Drill Conducted	4	4
Emergency Drill Conducted	12	12
Fire Tenders Availability (%)	95	96.8
Hydrant Pumps Healthiness (%)	100	100
Inspection of FDPS system including DV operation (%)	100	100
Safety training man-hrs. / person (Monthly)	100	138

Source: DBPL

LE's Observations/Comments

- *There are standard log sheets that are being properly filled, monitored & maintained.*
- *Standard Operating Procedures are developed & followed for important plant operations.*
- *Defect management system is in place which ensures safe isolation/ normalization of plant and equipment after the defect is reported/ rectified. The defect management is done through a SAP-run system.*
- *As per record, 99.41 % of the planned preventive maintenance activities are completed by DBPL in the FY 20-21. As per the maintenance record, defect maintenance and rectification achieved in FY 20-21 is about 94.49 %, DBPL reported that the balance defects rectification is under progress.*
- *Condition of lubricating oil & hydraulic oil is being monitored as per OEM recommendations for ensuring performance & reliability of equipment.*
- *Safety practices & safety infrastructure is as per industry standard.*

- *A standard Work Permit System (PTW) is followed taking care of safety precautions for each type of work. Lock Out- Tag out (LOTO) system is implemented for isolation / normalization process during maintenance.*
- *No fatal accidents and zero Lost Time Injury (LTI) were reported during the FY 2020-2021. Safety training is being organized for contract workers and supervisors. Periodic Mock drills are conducted for emergency preparedness. Records are being maintained.*
- *Availability of the fire-fighting system equipment and its healthiness is ensured all the time.*
- *DBPL informed that Plant Diesel Generators', emergency DC drives, plant battery & UPS are in healthy conditions. Trial runs at periodic intervals are being done for the Diesel Generators & emergency DC drives. Health check for plant battery and UPS systems are regularly monitored through standard checklists.*
- *The plant chemical laboratory is functional and regular analysis of samples is being done and reported.*
- *Plant effluents treatment system is operating in a proper condition. Plant effluents are properly treated & stored in a guard pond to use in horticulture, gardening & other cleaning uses.*

3.7 Review of Training Program:

DBPL has developed a well-defined training program for their employees. A training calendar is published and people are nominated to attend the same as per requirement for competency built up. Technical and non-technical training programs conducted for the executives and non-executives during the FY 20-21 are given below:

Table: Trainings Conducted during FY 20-21

S. No	Name of the Program	DOP	Organization/ Faculty	Targeted Employees	Duration (Days)	No of Employees
1	APC Optimization by CEP De Staging	5.08.20	Mr Hadi Abbas Mirza	All HOD's E & M Grade	0.125	50
2	Thermal Power Plant Summit on Best Practices in thermal power Plant to improve energy efficiency	20.08.20	CII	All HOD's E & M Grade	2	50

S. No	Name of the Program	DOP	Organization/ Faculty	Targeted Employees	Duration (Days)	No of Employees
3	Online Webinar On "Advanced Rotor Dynamics"	26 & 28.10.20	Dr. K V Bhaskara Sarma (Mech Eng-IIT Delhi)	Up to M5 grade	0.239	15
4	Technical Knowledge Sharing	22.12.20	Mr. Devraj, Ex GM BHEL	E & M grade	0.083	35
5	Presentation on Combustion optimization	8.01.21	Mr S Kavidass, Ex-BHEL	All HOD's E & M Grade	1	50
6	Reducing Net Heat Rate - for TPPs	18.02.21, 19.02.21	Mission Energy	All HOD's E & M Grade	2	30
7	Presentation On O&M Best Practices	23.02.21	Mr S Kavidass, Ex-BHEL	All HOD's E & M Grade	1	27
8	Presentation On Turbine Overhauling Practices	17.04.21	Six india.com	E & M Grade	0.125	18

Source: DBPL

3.8 Review of Spares Management

DBPL has received the mandatory spares from the OEMs. As per the EPC Contracts, most of mandatory spares were delivered by respective contractors. The mandatory spares received from OEM/EPC contractors are mostly of critical items considering 2 years operation period. However, DBPL indicated that they have bought more spares for smooth operation of Units even during the first 2 years of operation phase. All vendors are cooperating and DBPL is receiving the full support on need based.

Spares & consumables are stored properly in stores buildings and records are maintained in SAP. Inventory is generated & managed in a systematic procedure.

Value of spares issued & spares procured in FY 2020-21 for maintenance of plant was around Rs. 15.81 Crore & Rs. 17.65 Crore, respectively as tabulated below:

Table: Spares Consumption, Receipt and Stock during FY 20-21

Opening Balance on 1st Apr-2020	Receipt FY 20-21	Issues FY 20-21	Closing Balance On 31st Mar-2021
42.63	17.65	15.81	44.52

Source: DBPL *All values in (In Rs. Cr.)*

Mandatory Spares Inventory for main BTG package (BHEL spares) and BOP spares is tabulated below:

Table: Mandatory Spares Inventory at end of FY 20-21

Description of Inventory	Inventory Value (In Rs. Cr.) on 31.03.2020
Mandatory Spares-BHEL	85.27
Mandatory Spares-BOP	17.12

Source: DBPL

LE's Observations/Comments

- *Spares/ Consumables & Inventory Control Management were found to be structured and at par with standard industry practice.*
- *DBPL is maintaining spares/ consumables based on the experience and past records.*
- *LIE opines, DBPL shall maintain the minimum recommended spares as per OEM for critical equipment.*

4.0 REVIEW OF BUDGET AND ACTUAL EXPENDITURE:

The financial performance for FY 2020-21 is as below:

Table: Financial Performance

Particulars	**2021**	**2021**	**2022**
	Projected*	**Audited**	**Projected**
Sales Revenue	2,872	2813	2698
Other Income	-	117	39
Total Revenue	**2,872**	**2930**	**2737**
Cost of fuel	1,574	1278*	1340
O&M Cost	233	284**	251
Operating Profit	**1,065**	**1368**	**1146**
Finance Cost - Term Loan	643	596	578
Finance Cost - Working Capital incl. STL	90	44	76
Profit Before Dep. & Tax	**332**	**728**	**492**
Depreciation	310	322	311
Profit Before Tax (PBT)	**22**	**406**	**181**
*Based on FGD financial Model appraised by lenders	All Values in Rs. Crore		

Source: DBPL

For FY 20-21, against the estimated total revenue of Rs.2874 Cr. company has achieved a total revenue of Rs.2813 Cr.

Other income (for FY 20-21) majorly includes the ~91.68 Cr. late payment surcharge collected and ~ 14.65 Cr. Interest of FD.

*While linkage coal cost remained unchanged, coal procured through Spot/ e-auction for untied capacity was at a much lower price because of significant drop in premium due to lower offtake of coal in view of subdued electricity demand during COVID pandemic.

**Above audited O& M cost is inclusive of ~ 84 Crores PoC charges which are reimbursed by procurer under per long terms PPAs. Accordingly, the net O&M cost after reducing the reimbursable PoC charges, worked out as 200 Crore which translate to 16.66 Lac/MW. The O&M Cost incurred in FY 20-21 is lower than CERC normative O&M cost (for FY20-21, CERC normative O&M cost is Rs.20.97 lacs / MW).

Company has recorded an operating profit of Rs.1368 Crore for FY 2020-21.

5.0 STATUS OF APPROVALS

The status of the approvals required for the plant in operation is summarized below:

Table: Statutory Approvals and Status

Sl. No.	Approval	Issuing Authority	Status	Validity
1	Boiler Operation License	Boiler inspection dept.	CG/639-Unit 1	valid till 29.07.2021
			CG/640-Unit 2	valid till 02.12.2021
2	Registration of Industry	Ministry of Commerce & Industry	201/SIA/IMO/2008 dated 24.01.2008	One time
3	Environmental clearance	MOEF	J- 13012/79/2008-IA. II (T) dated 16-Sept.-2010	5 years from date of COD
4	Registration under Factory Act	Ind. Health & Safety	63029/63029/B-5/JNGR/2m(i) Dt. 01.01.2018	Valid till 31.12.2022
5	Water allocation and agreement	WRD, CG	Obtained for 40 MCM from River Mahanadi.	One time
6	Storage of Fuel (LDO)	PESO	P/HQ/CG/15/672 (P312095)	valid till 31.12.2023
7	Consent to Operate under air Act	CECB	5251/TS/CECB/2017	Valid till 22.02.2024
8	Consent to Operate under water Act	CECB	5249/TS/CECB/2017	Valid till 22.02.2024
9	Authorization under Hazardous Waste Rules	CECB	6207/HSMD/HO/CECB/2019	Valid till 31.08.2024
10	Measures relating to safety and electrical supply	CEA	WRIO/CG/Champa/DB Power/C-2100/SE/2019/004419-20	30.08.2021
11	Authorization of Bio-Medical Waste Rules	CECB	1502/HMW/HO/CECB/2018	One Time

Source: DBPL

Latest MoEF&CC Notification for Emission Compliance and Status of DBPL

Ministry of environment, forest and climate change MoEF&CC), Government of India vide notification S.O. 3305 (E) dated 07/12/2015 amended the Environment (Protection) Rules-1986 and prescribed the water consumption limits and emission limits for the Thermal Power Plants (TPP).

Following emission norms are applicable to DBPL, considering the units achieved COD in 2015 & 2016.

- Standards for Emissions:
  - Particulate matter : 50 mg/Nm^3
  - Sulphur Dioxide (SO_2): 200 mg/Nm^3 (Units having capacity of 500 MW & above)
  - Oxides of Nitrogen (NOx): 450 mg/Nm^3 (revised from 300 mg/Nm^3)
  - Mercury (Hg): 0.03 mg/Nm^3
  - Specific water consumption up to maximum 3.5 m^3 / MWh
- As per shared information, average water consumption of the plant during FY 20-21 is 2.11 m^3/MWh which is presently well below the prescribed limit in latest MoEF&CC notification.
- As per shared reports Stack Particulate matter (SPM) emission was around 41 mg/Nm3 which is within prescribed limit.
- Stack Emission Monitoring Reports (third party) of Unit-1 & 2 shows NOx emission remains slightly higher (444 to 482 mg/Nm3) than the revised prescribed limit i.e. 450 mg/Nm3. In view of revised norms for NOx, BDPL has to reinitiate talk with BHEL for implementation of NOx abatement requirements.
- Stack Emission Monitoring Report (3rd party) of Unit-1 & 2 also shows that SOx emission remains between 1386-1524 mg/Nm3, which is higher than the prescribed limit i.e. 200 mg/Nm3 . To comply with the norms, DBPL is in process of installing the FGD system.
- DBPL has appointed M/s. Black & Veatch as consultant for installation of FGD. The consultant has carried out the feasibility report and recommended Wet FGD as suited technology for meeting SO2 limits and Installation of OFA with Low NOx burners (LNB) for meeting NOx limits
- As per the earlier released phase plan by CEA for installation of FGDs– DBPL Unit-2 was required to be installed FGD by 30.09.2020 and Unit-1 by 30.06.2021. Accordingly, DBPL signed off EPC contract for FGD system with Chinese EPC contractor M/s TUNA corporation in September 2019. Site mobilization was planned to commence from 1st Quarter 2020 but due to spreading of Covid-19 and other reasons, FGD project got delayed. In view of the same DBPL has given written communication to CPCB and CEA and sought a time extension of 02 years.
- DBPL has given latest status of FGD to CEA via letter no. DBPL/CEA/FGD/15102020 dtd. 15.10.2020

- As per MoP office memorandum dtd. 20.01.2021, on account of uncertainties/ delays due to COVID-19 pandemic and on account of other issues like import restrictions, minimum local component condition under Atma Nirbhar Bharat, liquidity crunch in power sector, credit refusals due to high stress in power sector, regulatory delays etc., an extension of 02 years to the existing CPCB time line is considered for the 448 operational power plants. According to the list, the revised dates for installation of FGD for DBPL units are mentioned as : Unit-1 June 2023 & Unit-2 Sept. 2022
- On 08 January 2021, DBPL & M/s. TUNA Signed off amendment-01 to offshore supply contract agreement, along with some technical amendments ZERO date of contact is also amended to 1st Oct' 2021. Accordingly FGD commissioning are scheduled as: Unit-1 June 2022 and Unit-2 Sept. 2022.

LE's Observations / Comments:

- *DBPL has the necessary approvals required for the plant in operation. DBPL monitors the statutory compliance requirements and initiates the renewal process as per the due dates.*
- *Unit-1 Boiler operation license is due for renewal on 29th July 2021 and Unit-2 on 2nd December 2021. DBPL shall take suitable action to renew the license.*
- *Consent to Operate (CTO) under Water Act and Air Act is renewed during this FY valid for next three years (till 22nd February 2024)*
- *Based on the gross generation and raw water consumption data, DBPL is operating well within the limits for water consumption.*
- *Each unit is provided with high efficiency Electrostatic precipitator (ESP) to control SPM emission to stack. Stack emission also remains within the prescribed limits.*
- *In view of revised norms for NOx, BDPL shall reinitiate talk with BHEL for implementation of NOx abatement requirements.*
- *As per agreed schedule between DBPL and M/s TUNA for installation of FGD, DBPL will be able to meet the revised deadline given by CEA.*

DIGITAL SIGNATURE

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ANNEXURES

Annexure – 1 Summary of Power Purchase Agreements

Summary of Power Purchase Agreement

D B Power Ltd (DBPL) has entered into three (3) power purchase agreements to sell power from its 1200 MW project with Chhattisgarh State Power Trading Company Limited, PTC India Limited and Tamil Nadu Generation and Distribution Corporation Limited.

PPA 1: Chhattisgarh State Power Trading Company Limited (CSPTCL)

DBPL has entered into Power Purchase Agreement (PPA) with CSPTCL for a period of 20 years from commencement of supply. Company has informed that it has commenced supply of power from 1st August 2015.

Terms	Description
Seller	D B Power Ltd.
Procurer	Chhattisgarh State Power Trading Company Limited
Date of PPA	January 5, 2011
Contracted Capacity	Contracted Capacity shall be equal to 30% of the Aggregate Capacity of the Project and shall be in addition to the Contracted Output. (30% of installed capacity ~ 360 MW)
Contracted Output	5% of the Net Power generated by the Project. Provided that if the Company is allocated captive coal block also in the State of Chhattisgarh an additional 2.5% of the net power generated by the project shall also be supplied by the Company to the State Government of Chhattisgarh at energy charge. (5% of net power ~ net 56.4 MW / ~ gross 60 MW, Additional 2.5% of Net Power in proportion to use of coal from captive coal mine ~ 10 MW)
Contracted Power	Sum of Contracted Capacity in percentage & Contracted Output in percentage of installed capacity.
Term of PPA	20 Years (20th anniversary of the date of commencement of Supply)
Delivery Point	Outgoing gantry of the 400 KV bus of Power Station Switch yard. The Contracted Power shall be evacuated by the Procurer through dedicated transmission line constructed and owned by the Company. For wheeling of the Contracted Power from the bus bar of Power Station of the Company to connecting point of CTU, the transmission charges for utilization of Company's transmission line shall be payable by Procurer to the Company by way of Capacity Charge. Accordingly the

Terms	Description
	Company shall include the cost of dedicated transmission line in the Project Cost for computation of Capacity Charge.
Normative Availability for Tariff calculation	Normative annual plant availability factor in percentage as per CERC Regulations. As per CERC regulation 2014-19, the normative plant availability is 85%.
Tariff	Tariff for supply of Contracted Power to Procurer from the Generating Station of the Company under this Agreement shall be determined in accordance with CERC Regulations from time to time. (i) The Tariff shall be paid in two parts comprising of Capacity and Energy Charge. (ii) Annual Fixed Charge consist of return on equity, interest on loan capital, depreciation, interest on working capital, operation and maintenance expenses, cost of secondary fuel and special allowance in lieu of R&M or separate compensation allowance. (iii) The energy charge shall cover the coal cost and shall be payable by procurer.
Transmission/Wheeling Charges / RLDC & SLDC Charges and Scheduling Charges	Payment of the transmission charges, wheeling charges, transmission losses, RLDC and SLDC charges as determined by the Appropriate Commission and all other charges, taxes, cess, fees, levies and duties applicable to the generation, sale, purchase, dispatch and transmission of the Contracted Power, to appropriate agencies; shall be the obligation of the Procurer.
Non-performance of Obligation	if the Contracted Output and/or the Contracted Capacity is not made available in full or part thereof by the Company as per the terms of this Agreement to Procurer for reasons attributable to the Company for a period of equal to or more than Two (2) continuous months or four (4) non-continuous months in a Financial Year, then it shall be treated as a Company Event of Default as per Article 14.1 of PPA. Further the Procurer shall have the right to ask GoCG to withdraw all facilities extended to the Company under the IA or availed by the Company. In addition to the above, for every additional day, of non-supply of power by the Company to Procurer, beyond the period specified in the para in Article 4.7of the PPA, the Company shall pay a penalty to Procurer for the amount equivalent to the total Capacity Charges (in Rs.) corresponding to the Contracted Capacity that would had

Terms	Description
	been drawn by Procurer in normal conditions on such day provided such total penalty charges shall not exceed two (2) months Capacity Charges. Notwithstanding above penal provision, no capacity charge shall be paid to the Company for the days on which supply obligation was not made by it.
Right to Contracted Output	The quality of such power shall be firm power and at no time the Company shall be supplying such power less than ninety percentage (90%) of the percentage of the Contracted Output. Further such percentage shall not be more than one hundred and ten percentage (110%) during the off-peak periods. The off-peak period shall be notified by the Appropriate Commission from time to time. The above conditions are subject to the regulations of CERC and the provisions of IEGC. In the event the Procurer fails to dispatch all or part of the Contracted Power at any time, the Company shall be entitled to sell such non dispatched Contracted Power to third parties. For any such third party sale, all open access charges including losses shall be payable by such third party as per regulations (s) of the Appropriate Commission(s). • In such event, Procurer shall continue to be liable to pay the Capacity Charges determined as part of the Tariff, to the Company for such Contracted Capacity. Furthermore, in such a case, the sale price realized by the Company in excess of Variable Charges determined as part of the Tariff shall be shared by the Company and the Procurer in equal ratio.
Obligation of the Company	As per Clause No 4.2.1 (vi) of PPA, Project Company has to ensure Coal stock adequate for 15 days of generation at 85% PLF throughout the Term of Agreement.

PPA – 2 (PTC India Limited – for RVPN)

DBPL has entered into Power Purchase Agreements (PPA) with PTCIL on the understanding that PTCIL has already entered into a PPA (Procurer(s) – PPA) dated November 1, 2013 with Jaipur Vidyut Vitran Nigam Limited, Ajmer Vidyut Vitran Nigam Limited and Jodhpur Vidyut Vitran Nigam Limited. PTCIL has signed Procurer(s) – PPA under Case – I Tariff Based Competitive Bidding Process.

Salient Features of the Power Purchase Agreement with PTCIL:

Terms	**Description**
Seller	D B Power Limited (DBPL)
Procurer	PTC India Limited (PTCIL)
Date of PPA	November 1, 2013
Contracted Capacity	• 410 MW • As per Procurers – PPA, following is the contracted capacity with respective Procurer: Jaipur Vidyut Vitran Nigam Limited – 159.90 MW Ajmer Vidyut Vitran Nigam Limited – 118.90 MW Jodhpur Vidyut Vitran Nigam Limited – 131.20 MW
Delivery Point	STU Interface in Rajasthan (As per Procurers – PPA)
Interconnection Point	Point where the power from the Power Station switchyard bus of the Seller is injected into the interstate / intrastate transmission system (including the dedicated transmission line connecting the Power Station with the interstate /intrastate transmission system)
Term of PPA	25 Years
Normative Availability (As per Procurers PPA)	85% availability of the aggregate contracted capacity at the Interconnection Point on Contract Year basis.
Minimum Offtake Guarantee (As per Procurers PPA)	65% of the total Contracted Capacity for the Procurer or all Procurers together, as the case may be, during a Contract Year.
Tariff	The Tariff payable by PTC to Company shall be sum of Capacity Charges and Energy Charges paid by Procurer to PTC minus PTC Trading Margin excluding the transmission charges as paid by Procurer(s) to PTC in accordance with Clause 4.4 of the Schedule 4 of the Procurer(s) -PPA. PTC – Trading Margin:

Terms	Description
	• In case the Company achieves Normative Availability of 85% or more from the Coal Linkage of CIL/Coal block, the Trading Margin of PTC will be 2.5% of Capacity Charges plus Energy Charges or 10 Paisa/unit whichever is lower. • In case the Company could not achieve Normative Availability of 85% from the Coal Linkage of CIL /Coal block, the Trading Margin of PTC will be 2.5% of Capacity Charges plus Energy Charges or 8 Paisa/unit whichever is lower. As per Procurers PPA, The Tariff shall he paid in two parts comprising of Capacity Charge and Energy Charge as mentioned in Schedule 8 of PPA. The full Capacity Charges shall be payable based on the Contracted Capacity at Normative Availability and Incentive shall be provided for Availability beyond 86% as provided in this Schedule. In case of Availability being lower than the Normative Availability, the Capacity Charges shall he payable on proportionate basis in addition to the penalty to be paid by the Seller as provided in this Schedule. As per Procurer(s) -PPA, Company is entitled to sell power to third parties under certain circumstances. Under such circumstances, Company & PTC shall make joint efforts to sell the contracted power to others as per the terms and conditions of Procurer(s) – PPA. Surplus, if any, as per Procurer(s) – PPA from such sale, which accrues to PTC, shall be passed on to Company after deducting the PTC Trading Margin. However, any Capacity charges payment if made by Procurer(s) for this capacity, would be passed on to Company.
Contract Year Energy Incentive Payment (As per Procurers PPA)	If and to the extent the Availability in a Contract Year exceeds Normative Availability, an incentive at the rate of 40% of the Quoted Non Escalable Capacity Charges (in Rs. / kWh) for such Contract Year mentioned in Schedule 8 of the PPA, subject to a maximum of 25 paise/kWh, shall be allowed on the energy (in kWh) corresponding to the Availability in excess of eighty six percent (86%).
Contract Year Penalty for Availability below 80% during the contract Year	In case the Availability for a Contract Year is less than 80%, the Seller shall pay a penalty at the rate of twenty percent (20%) of the simple average Capacity Charge (in Rs./kWh)

Terms	Description
(As per Procurers PPA)	for all months in the Contract Year applied on the energy (in kWh) corresponding to the difference between 80% and Availability during such Contract Year.
Deviation from the schedule (As per Procurers PPA)	Variation between Scheduled Energy and actual energy at the Interconnection Point shall be accounted for through Unscheduled Interchange (UI) Charges.
Transmission/Wheeling Charges and Scheduling Charges	The monthly transmission charges paid by Procurer(s) to PTC and as provided in article 4.4 of the Schedule 4 of the Procurer(s) -PPA shall be received by PTC and reimbursed to Company, if the same has been paid by Company to CTU. As per Procurers PPA, Procurers are responsible for payment of the Transmission Charges (from the Injection Point onwards) and applicable RLDC / SLDC charges, limited to the charges applicable to the Contracted Capacity of Procurer(s). The Procurer(s) shall reimburse any of the above charges, if paid by the Seller. As per Procurer PPA, Transmission losses from the Interconnection Point onwards would be borne by the Procurer(s), and power lost on account of transmission loss would be to the account of the Procurer(s).
Penalty and rights relating to Minimum Guaranteed Quantity of Fuel (As per Procurers PPA)	In case Developer has to pay penalty to the Fuel supplier for not purchasing the minimum guaranteed quantity of Fuel mentioned in the Fuel Supply Agreement and if during that Contract Year Availability of the Contracted Capacity is greater than the Minimum Offtake Guarantee but "the Procurer" / "all the Procurers taken together" has / have not Scheduled Energy corresponding to such Minimum Off-take Guarantee during that Contract Year, then Seller will raise an invoice for the lower of the following amount on the Procurer(s); i) penalty paid to the fuel supplier under the Fuel Supply Agreement in that Contract Year, along with documentary proof for payment of such penalty, or ii) an amount corresponding to twenty percent (20%) of cumulative Monthly Capacity Charge Payment (in Rs.) made by the Procurer for all the months in that Contract Year multiplied by (1- X/Y) where: X is the Scheduled Energy during the Contract Year for TPTCL (in kWh); and

Terms	Description
	Y is the Scheduled Energy corresponding to Minimum Off-take Guarantee for the Procurer during the Contract Year (in kWh).
Right to Contracted Capacity and Scheduled Energy (As per Procurers PPA)	Subject to· provisions ·of the Agreement, the entire Aggregate Contracted Capacity shall be for the exclusive benefit of the Procurer(s) and the Procurer(s) shall have the exclusive right to purchase the entire Contracted Capacity from the Seller. The Seller shall not grant to any third party or allow any third party to obtain any entitlement to the Contracted Capacity and/or Scheduled Energy. The Seller is free to sell such power to any third party prior to the Scheduled Delivery Date or Revised Scheduled Delivery Date(s) as the case may be and any capacity which is in excess of the quantum of power agreed to be supplied under this Agreement from each such Revised Scheduled Delivery Date(s). Further notwithstanding above, the Seller shall be permitted to sell power, being a part of the Contracted Capacity to third parties, if: i) there is a part of Available Capacity corresponding to the Contracted Capacity which has not been Dispatched by the Procurer, ordinarily entitled to receive such part ('Concerned Procurer'); and ii) such part has first been offered, at the same tariff: to the other Procurer(s) (by the Seller), who were not ordinarily entitled to receive such part and they have chosen to waive or not to exercise their first right to receive such part of the Available Capacity within two (2) hours of' being so offered the opportunity to receive such part subject to the provisions regarding scheduling as per IEGC If the Procurer does not avail of power up to the Available Capacity provided by the Seller corresponding to the Contracted Capacity, the Seller shall be entitled to sell such Available Capacity not scheduled by the Procurer, to any person without losing the right to receive the Capacity Charges from the Procurer for such unavailed Available Capacity. In such a case, the sale realization in excess of Energy Charges shall be equally shared by the Seller and the Procurer. In the event, the Seller sells such Available Capacity to any direct or indirect Affiliate of the Seller/

Terms	Description
	shareholders of the Seller without obtaining the prior written consent of the Procurer, the Seller shall be liable to sell such Available Capacity to such entity at Tariffs being not less than the Tariff payable by the Procurer. During this period, the Seller will continue to receive the Capacity Charges from the Procurer. The sale under Unscheduled Interchange shall not be considered as sale to third party for the purposes of this Agreement.
Alternative Source of' Power Supply (As per Procurers PPA)	During the Operating Period, if the Seller is unable to provide supply of power to the Procurer up to the· Aggregate Contracted Capacity from the Power Station except due to a Force Majeure Event or due to a Procurer Event of Default, the Seller is free to supply power up to the Aggregate Contracted Capacity from an alternative generation source to meet its obligations under this Agreement. Such power shall be supplied to the Procurer at the same Tariff as per the terms of this Agreement and subject to provisions of Article 4.6.2 below. In case the transmission and other incidental charges, including but not limited to application fees for open access, RLDC/SLDC charges, etc., applicable from the alternative source of power supply. are higher than the applicable Transmission Charges from the Injection Point to the Delivery Point, the Seller would be liable to bear such additional charges. The Seller shall be permitted to supply power to the Procurer from any alternative source for a maximum continuous duration of six (6) Months or a maximum non continuous period of twelve (12) months during the Operating Period, excluding any period of supply from alternative generation source that the Seller avails prior to the commencement of supply from the generation source named in this Agreement.

PPA 3: Tamil Nadu Generation and Distribution Corporation Limited

DBPL has entered into Power Purchase Agreements (PPA) under Case – I Tariff Based Competitive Bidding Process with Tamil Nadu Generation and Distribution Corporation Limited for a period of 15 years on August 19, 2013.

Terms	Description
Seller	D B Power Limited
Procurer	Tamil Nadu Generation and Distribution Corporation Limited (TANGEDCO)
Date of PPA	August 19, 2013
Contracted Capacity	208 MW
Term of PPA	15 Years (From February 1, 2014 to September 30, 2028)
Delivery Point	TANGEDCO periphery (STU Interface)
Injection Point	POWER GRID CORP. INDIA LTD'S Substation at Kotra, Chhattisgarh
Interconnection Point	Point where the power from the Power Station switchyard bus of the Seller is injected into the interstate/intrastate transmission system (including the dedicated transmission line connecting the Power Station with the interstate/intrastate transmission system)
Normative Availability	85% Availability of the Aggregate Availability" Contracted Capacity at the Interconnection Point on Contract Year basis.
Minimum Off-take Guarantee	65% of the Aggregate Contracted Capacity for the Procurer, as the case may be, during a Contract Year.
Tariff	The Tariff shall be paid in two parts comprising of Capacity and Energy Charge as mentioned in Schedule 8 of PPA. The Full Capacity Charges shall be payable based on the Contracted Capacity at Normative Availability and Incentive shall be provided for Availability beyond 85%. In case of Availability being lower than the Normative Availability, the Capacity Charges shall be payable on proportionate basis in addition to the penalty to be paid by Seller as per provision of PPA.
Contract Year Energy Incentive Payment	If and to the extent the Availability in a Contract Year exceeds eighty five (85%) percent, an incentive at the rate of 40% of the Quoted Non Escalable Capacity Charges (in Rs./kWh) for such Contract Year mentioned in Schedule 8 of the PPA, subject to a maximum of 25 paise/kWh, shall be allowed on the energy (in kWh) corresponding to the Availability in excess of eighty five percent (85%).
Contract Year Penalty for Availability below 80% during the contract Year	In case the Availability for a Contract Year is less than 80%, the Seller shall pay a penalty at the rate of twenty percent (20%) of the simple average Capacity Charge (in Rs./kWh) for all months in the Contract Year applied on the

Terms	Description
	energy (in kWh) corresponding to the difference between 80% and Availability during such Contract Year.
Deviation from the schedule	Variation between Scheduled Energy and actual energy at the Interconnection TANGEDCO Point shall be accounted for through Unscheduled Interchange (UI) Charges.
Transmission/Wheeling Charges and RLDC/ SLDC Charges	The payment of POC and Non POC Charges to the CTU, from the Injection Point to the Delivery Point shall be paid by the Seller and would be reimbursed by the Procurer.
Penalty and rights relating to Minimum Guaranteed Quantity of Fuel	In case Seller has to pay penalty to the fuel supplier for not purchasing the minimum guaranteed quantity of Fuel mentioned in the Fuel Supply Agreement and if during that Contract Year, Availability of the Power Station of the Seller is greater than the Minimum Off take Guarantee but the Procurer have not scheduled energy corresponding to such Minimum Off-take Guarantee during that Contract Year, then Seller will raise an invoice for the lower of the following amounts, on the Procurer: I. penalty paid to the fuel supplier under the Fuel Supply Agreement in that Contract Year, along with documentary proof for payment of such penalty, or II. an amount corresponding to twenty percent (20%) of cumulative Monthly Capacity Charge Payment (in Rs.) for Procurer made for all the months in that Contract Year multiplied by (1- X/Y) where: X is the Scheduled Energy during the Contract Year for Procurer (in kWh); and Y is the Scheduled Energy corresponding to Minimum Off-take Guarantee for the Procurer during the Contract Year (in kWh).
Purchase and Sale of Available Capacity and Scheduled Energy	Unless otherwise instructed by the Procurer, the Seller shall sell all the Available Capacity up to the Contracted Capacity to the Procurer pursuant to Dispatch Instructions given by the Procurer.
SLDC & RLDC charges	All scheduling and RLDC / SLDC charges applicable shall be borne the Procurers.
Right to contracted capacity and Scheduled Energy	Subject to provisions of the Agreement, the entire Aggregate Contracted Capacity shall be for the exclusive benefit of the Procurer and the Procurer shall have the exclusive right to purchase the entire Contracted Capacity from the Seller. The Seller shall not grant to any third party

Terms	Description
	or allow any third party to obtain any entitlement to the Contracted Capacity and/or Scheduled Energy. Further notwithstanding above, the Seller shall be permitted to sell power, being a part of the Contracted Capacity to third parties, if: there is a part of Available Capacity corresponding to the Contracted Capacity which has not Dispatched by the Procurers, ordinarily entitled to receive such part. If the Procurer does not avail of power up to the Available Capacity provided by the Seller corresponding to the Contracted Capacity, the Seller shall be entitled to sell such Available Capacity not scheduled by the Procurer, to any person without losing the right to receive the Capacity Charges from the Procurer for such un-availed Available Capacity. In such a case, the sale realization in excess of Energy Charges shall be equally shared by the Seller and the Procurer. In the event, the Seller sells such Available Capacity to any direct or indirect Affiliate of the Seller/ shareholders of the Seller without obtaining the prior written consent of the Procurer, the Seller shall be liable to sell such Available Capacity to such entity at Tariffs being not less than the Tariff payable by the Procurer. During this period, the Seller will continue to receive the Capacity Charges from the Procurer. The sale under unscheduled Interchange shall not be considered as sale to third party for the purposes of this Agreement.