JOURNEY TOWARDS SUSTAINABLE FUTURE

By
Jai Prakash Verma,AGM EEMG
Shishir Nayak,DGM P&S

NTPC LTD FARAKKA

Presentation Outline

1. Company -Installed Capacity
2. Introduction of Station/Unit
3. Performance -Current Year
4. Performance Trends - Last 3 Years
5. Performance against MOU
6. Encon Projects
7. Environment &Ash Managment
8. Energy Management system
9. Performance Under PAT cycle
10. Performance review structure

Installed Capacity (NTPC OWNED AND JV'S)

The total installed capacity of the company is 73,024 MW (including JVs) own stations include 26 coal based, 7 gas based, 1 Hydro, 15 Solar and 1 Small hydro project. Under JVs and Subsidiaries, NTPC has 9 coal based, 4 gas based, 8 hydro based and 18 renewable energy projects. By 2032, non fossil fuel based generation capacity shall make up nearly 50% of NTPC's portfolio.

NTPC has been operating its plants at high efficiency levels. As on 31.03.2023 the company has 17% of the total national capacity and, it contributes 25% of total power generation of India due to its focus on high efficiency.

In October 2004, NTPC launched its Initial Public Offering (IPO) consisting of 5.25% as fresh issue and 5.25% as offer for sale by the Government of India. NTPC thus became a listed company in November 2004 with the Government holding 89.5% of the equity share capital. In February 2010, the Shareholding of Government of India was reduced from 89.5% to 84.5% through a further public offer. Government of India has further divested 9.5% shares through OFS route in February 2013. With this, GOI's holding in NTPC has reduced from 84.5% to 75%. The rest is held by Institutional Investors, banks and Public. Presently, GOI holding in NTPC is 51.10%.

NTPC is not only the foremost power generator; it is also among the great places to work. The company is guided by the "People before Plant Load Factor" mantra which is the template for all its human resource related policies. In 2019, NTPC is recognized as "Laureate" for consistently ranking among "Top 50 Best Companies to Work for in India" for last 11 years in the Great Place to Work and Economic Times survey. Besides, NTPC was also recognized as the best among PSUs and in Manufacturing.

NTPC LTD

NTPC Ltd

- **Current Installed Capacity of NTPC Group is 73,824 MW**

S.No	Fuel Source	No of Plants	MW
1	Coal	36	60,274
2	Gas	11	6,511
3	Hydro	9	3,725
4	Small Hydro	2	32
5	Solar PV	29	3119
6	Wind	3	163
	Total		73,824

NTPC has formulated a long term Corporate Plan to become a 130 GW company up to 2032

FARAKKA HIGHLIGHTS

Foundation of NTPC Farakka

29th December 1981

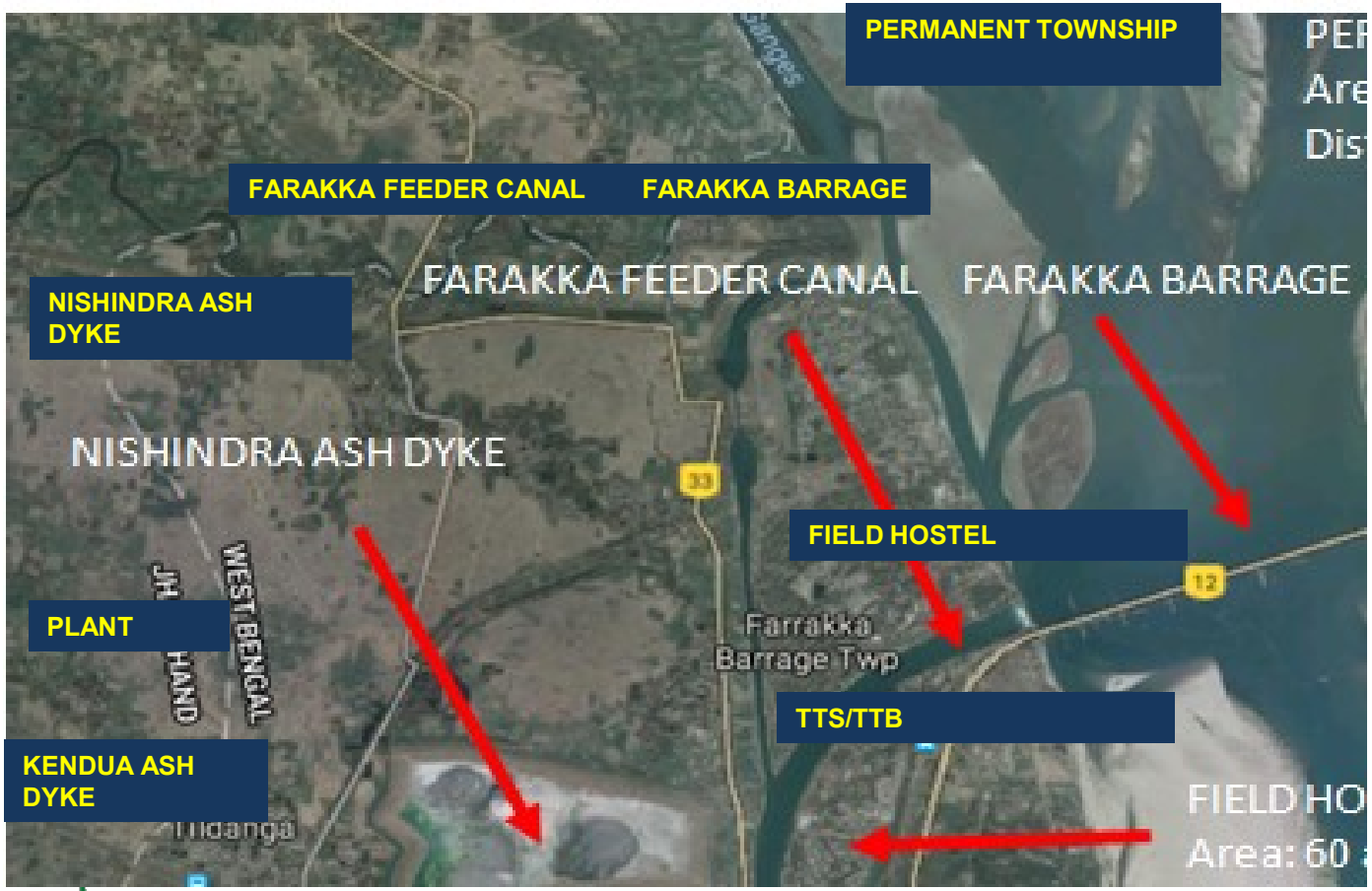
Foundation Stone by then Prime Minister Smt Indira Gandhi

Milestone Dates of NTPC Farakka

MILESTONE DATES OF NTPC FARAKKA

	Stage I (3 X 200 MW)			Stage II (2 X 500 MW)		Stage III (1 X 500 MW)
	Unit#1	Unit#2	Unit#3	Unit#4	Unit#5	Unit#6
SYNC	01-01-86	24-12-86	06-08-87	25-09-92	16-02-94	07-03-11
COD	01-11-86	01-10-87	01-09-88	01-07-96	01-04-95	04-04-12

Bird's Eye View of Farakka



Station Highlights FY 22-23

- FSTPS Generated 12,402.33 MU in FY 22-23.
- Approx. 4 lacs MT Fuel available in stackyard as a part of Monsoon preparation.
- Ash Utilization at 212.15% (52 LMT) for FY 22-23.
- Renovation and Modernization of ESP Completed.
- Station PLF is at 81.72% against National Average of 71.55 % as on date for FY 23-24

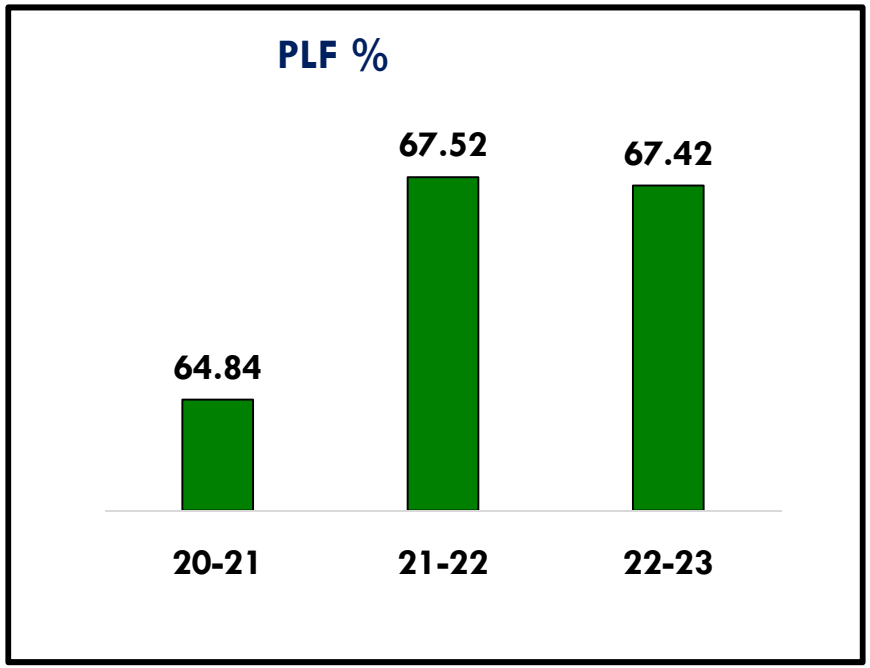
Station Highlights FY 23-24 Till Aug 23

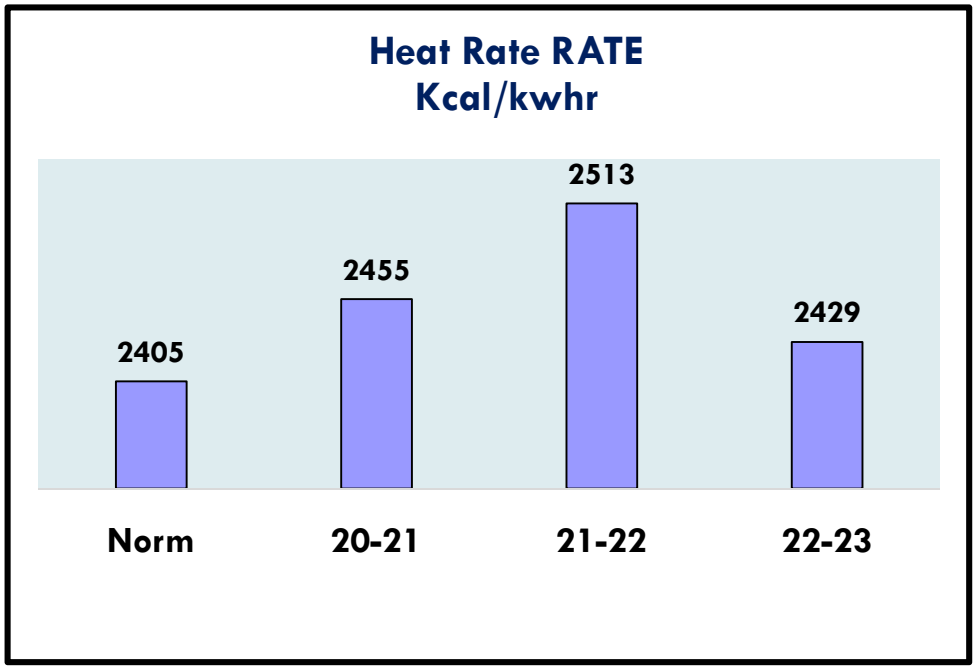
- Station has generated 5854.75 till Aug 23 with PLF 75.93%.
- Monthly Ash utilization in August 23 is 106.14% & 149.18% upto August 23.
- Unit 4 Boiler chemical cleaning completed after O/H.
- Unit 5 additive Co-firing (pilot project) completed.
- Specific water consumption upto August 2023 is 3.375 M3/MWhr against MOEF norm of 3.5 M3/MWhr.
- FGD : Stage-III Chimney Raft Completed.

Farakka Operational Highlights

S.No	Parameter	Up to Aug 23	FY 22-23
1	Generation in MU (12657MU)	**5854.75**	**12,402.33**
2	PLF in % (75%)	**75.93**	**67.42**
3	Availability including RSD %	**87.95**	**85.83**
4	DC % (85%)	**89.75**	**88.9**
5	Partial Loading Equip %	**1.326**	**0.589**
6	Planned Outage %	**8.71**	**11.81**
7	Forced Outage % (2.5%)	**2.34**	**2.36**
8	RSD %	**0.19**	**7.15**
9	APC Net % (7.3%)	**7.39**	**7.74**
10	Sp. Oil ml/ kwhr (0.6)	**0.66**	**0.75**
11	Heat Rate kcal/ kwhr (2424)	**2437**	**2450**

Sp. Energy Consumption in last 3 years (FY 20-21 to FY22-23)

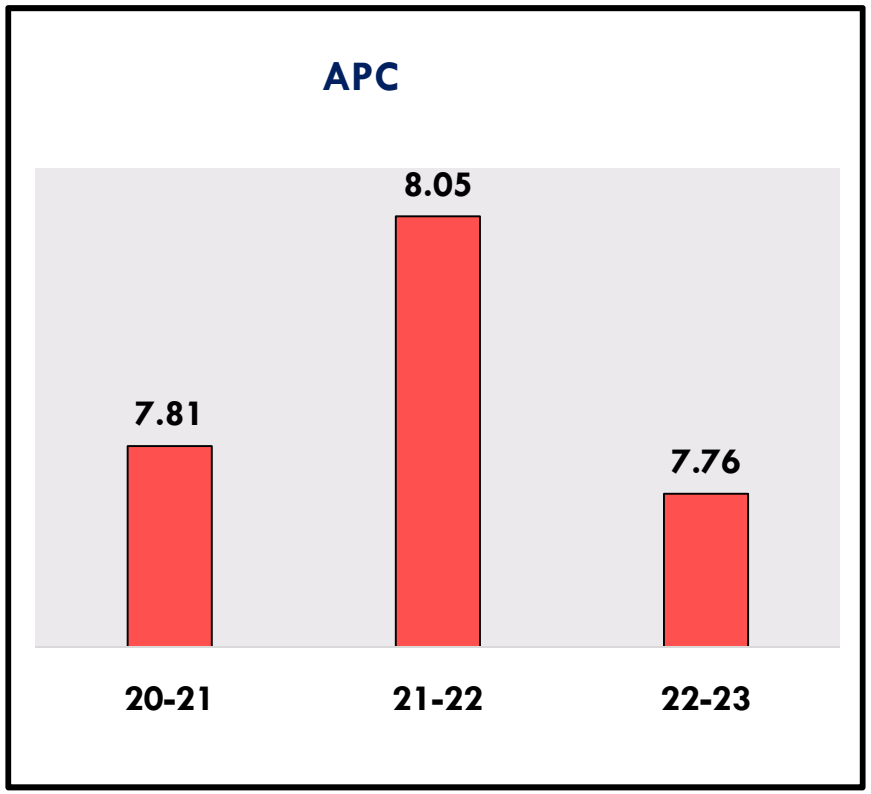


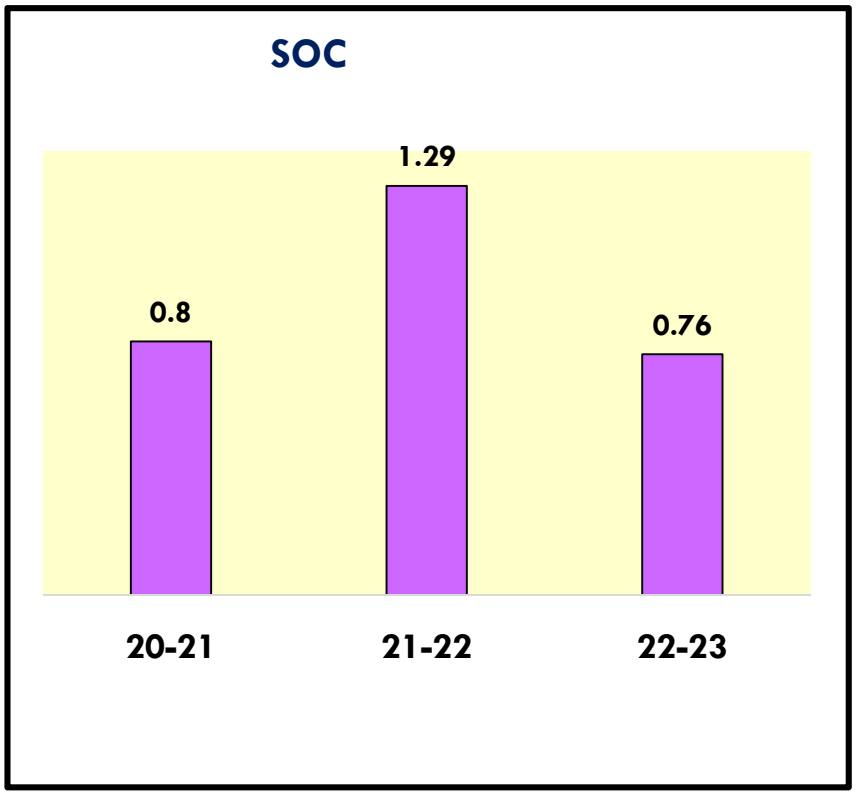


- Major GEN Loss Due to Grid +RSD 11+8=19%
- Planned Outage 11%
- FO 2.26%

- Major improvement 04 Nos major unit Overhaul in 22-23,
- Unit-6 HPT replacement
- Major HR Loss in Part load operation
- AUL 85.3%
- St-3 Cooling Tower capability

APC & Sp Oil Consumption last 3 years (FY 20-21 to FY22-23)

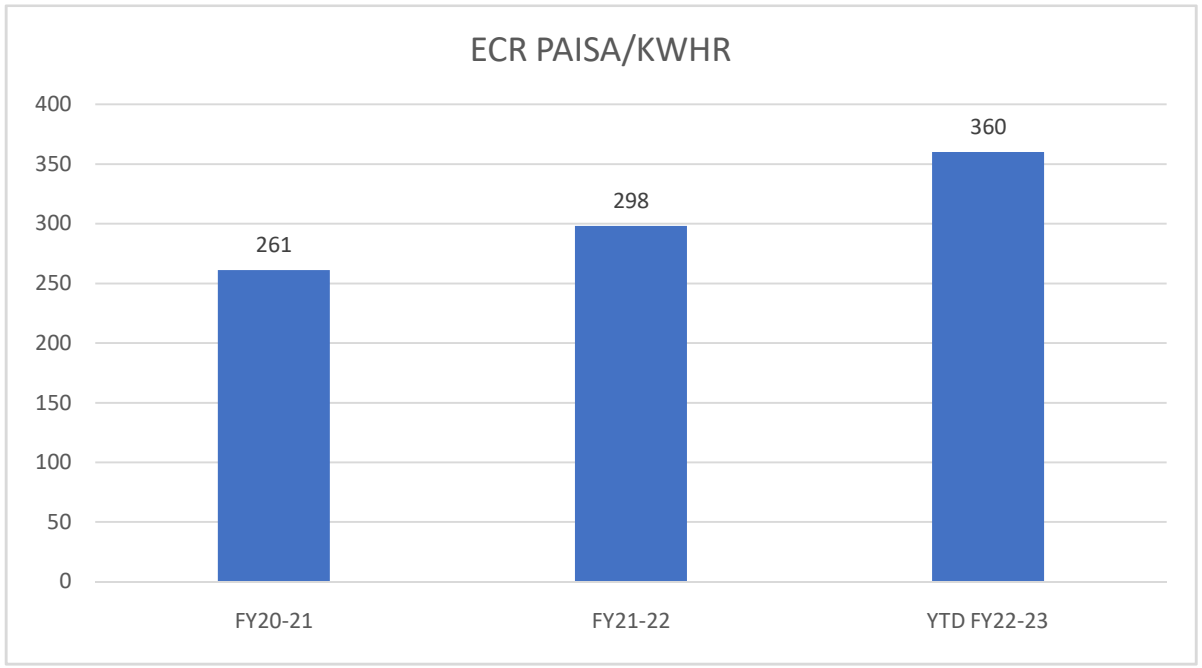




- High APC- Part load operation.
- 15 Nos RSD.
- High Draft power.
- ESP R&M
- Addition power to comply Environment Norms

- High SOC Oil fire for front fire boiler
- Mill startup S/D 0.15
- Startup(17 Nos. of RSD units 0.12

Energy Charges for Last 3 Year's- Consistent Approach



- Average Energy Charge for Last three year is with in Range of 260-360 Paisa per unit.
- ECR for FY 22-23 increased because of Import coal Receipt appx.11 %.

Energy Saving projects implemented in last three years

Year	No of Energy saving projects	Investments (INR Million)	Electrical savings (Million kWh)	Thermal savings (Kcal/kwhr)	Savings (INR Million)
FY 2020-21	St-1 MDBFP Cartridge (3B) Replacement in OH (U-3) MDBFP Cartridge (2C) Replacement in OH (U-2)	1.2	0.37		1.03
	U#6 APH Jet cleaning in SSD	1.2	0	1.925	5.2
	U#6 condenser hi pressure jet cleaning in SSD	0.5	0	4.5	0.5
	St-2 MDBFP Cartridge replacement	2.5	0.152		0.25

Energy Saving projects implemented in last three years

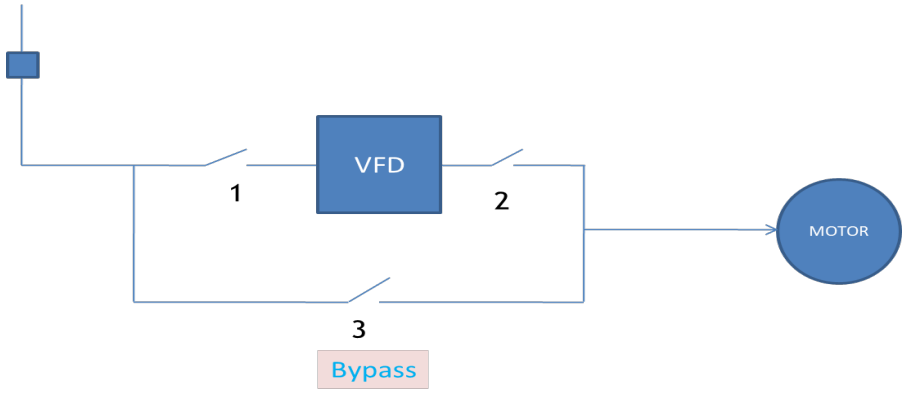
Year	No of Energy saving projects	Investments (INR Million)	Electrical savings (Million kWh)	Thermal savings (Kcal/kwhr)	Savings (INR Million)
FY 2021-22	Replacement of 250 watt sodium bulbs with 70 Watt LED	80.1	4.55	-	11.73
	CW pumps corrocoating for Energy saving, total power reduction achieved 29.5 kwhr	0.5	0.258	-	0.66

Energy Saving projects implemented in last three years

Year	No of Energy saving projects	Investments (INR Million)	Electrical savings (Million kWh)	Thermal savings (Kcal/kw hr)	Savings (INR Million)
FY 2022-23	Stoppage of Second running Vacuum pumps in Unit-4,5,6 by replacing new modified impellers	1.8	0.931	-	3.63
	CW pumps corrocoating for Energy saving, total power reduction achieved 29.5 kwhr	0.25	0.169	-	0.65
	Compressed air system operating Pressure optimization, Net compressed air power reduction observed is 175 kwhr since Nov-2022	0.55	0.93	-	0.5
	MDBFP Main pump cartridge replacement in St-1 200 MW units, 6.6 KV Motor Current reduction achieved by 11 amp, in 03 number pumps	7.5	2.319	-	9.46

ENCON PROJECT 2023
INSTALLATION OF VFD in CEP of 2X500 MW UNIT

Sr No	Particulars	Cost Estimate (Rs)
1	Supply of VFD, air conditioner, lighting, earthing and any other accessories required for proper functioning of VFD.	7,88,50,000.00
2	Construction of VFD room & Errection & commissioning of VFD's	89,00,000.00
3	Supply of mandatory spares.	17,85,000.00
4	AMC services (for Five years)	57,50,000.00
	Grand Total	9,52,85,000.00



Energy Saving

1817-1414 = 403 kw in Farakka ST-2

Total APC saving Potential

403*2*24*365*0.8 = 5.64 MU/year

Monitory saving Rs 1.80 Cr/year

Environment

Roof Top Solar

103 KW Operational

LED Lighting

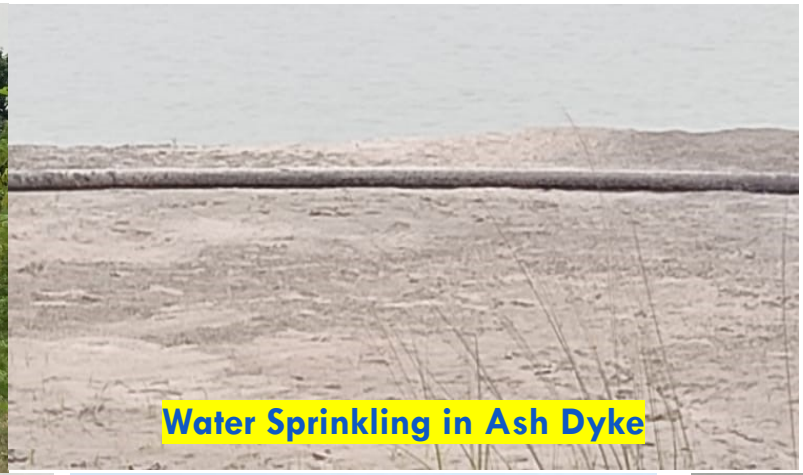
Rain Water Harvesting

Rain Water Harvesting Pits at Townships

Greenbelt Developments in Dykes

Environment Highlights 22-23

5,100 trees planted by NTPC Farakka



Water Sprinkling in Ash Dyke

Display of Environment Parameters

Water Sprinkling in Ash Dyke

Water Sprinkling on Roads

Water Sprinkling in Ash Dyke

STACK EMISSION PARAMETERS FOR LAST 3 YEARS

Particulars	UOM	2020-21	2021-22	2022-23
Total CO2 Emissions Per kW of Generation	Gram / kWhr	940	960	950
Current SOx Emissions at Full Load*	mg/Nm3	800	800	800
Current NOx Emissions at Full Load*	mg/Nm3	600	600	600/270
Particulate Matter *	mg/Nm3	150	80	75
Mercury*	Mg/Nm3	NA	NA	NA

INITIATIVE TAKEN TOWARDS ENVIRONMENT SUSTANIABILITY

- **FGD Installation is in progress will be completed by Dec 2025 in all stages.**
- **De NOx installation has been completed sucessfully in Stg 3.**
- **ZLD inside boundary has been implemented.**
- **ESP R&M of stg 2 has been completed in Stg 1 & 2 . Additional fields erected in Stg 2 units**

Flue Gas Desulphurisation (FGD)

Ash Utilization

Particulars	UOM	2020-21	2021-22	2022-23
Ash Stock in Plant (yard + pond)	MTons	2926346	2860278	2450067
Ash Generated	MTons	2849588	2788125	2521188
Ash Utilization	%	126.90	143.33	206.56
Ash Utilized in manufacturing of cement/concrete – other similar products	MTons	262137	248100	194918
Ash Utilized in Fly Ash Bricks	MTons	96248	6155.68	3954
Ash Utilized in Land filling/ Low lying area development	MTons	415409	174067.81	224161
Ash Utilized for rail/Roads embakement	MTons	2541929	2736245	4784690
Ash Utilization in Other Areas – Please mention below	MTons			
1. Ash dyke raising	MTons	NIL	NIL	222997
2.	%			
3.	%			
4.	%			
5.	%			
Expenditure on Ash Utilization (annual)	INR (Lakhs)	22010	22505	30620

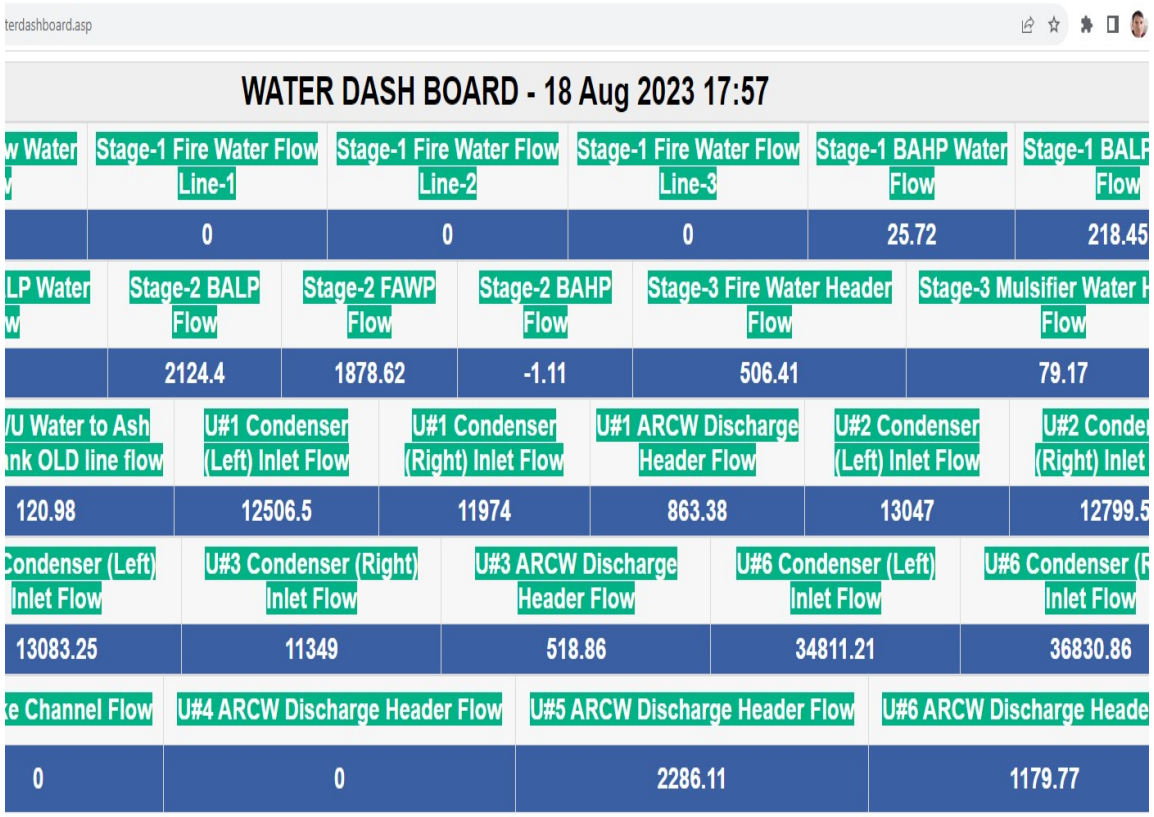
Ash Handling done through various methods

Ash Handled (Wet Method)	%	
Ash Handled (Dry Method)	%	7.88
Ash Handled (semi wet)	%	92.12

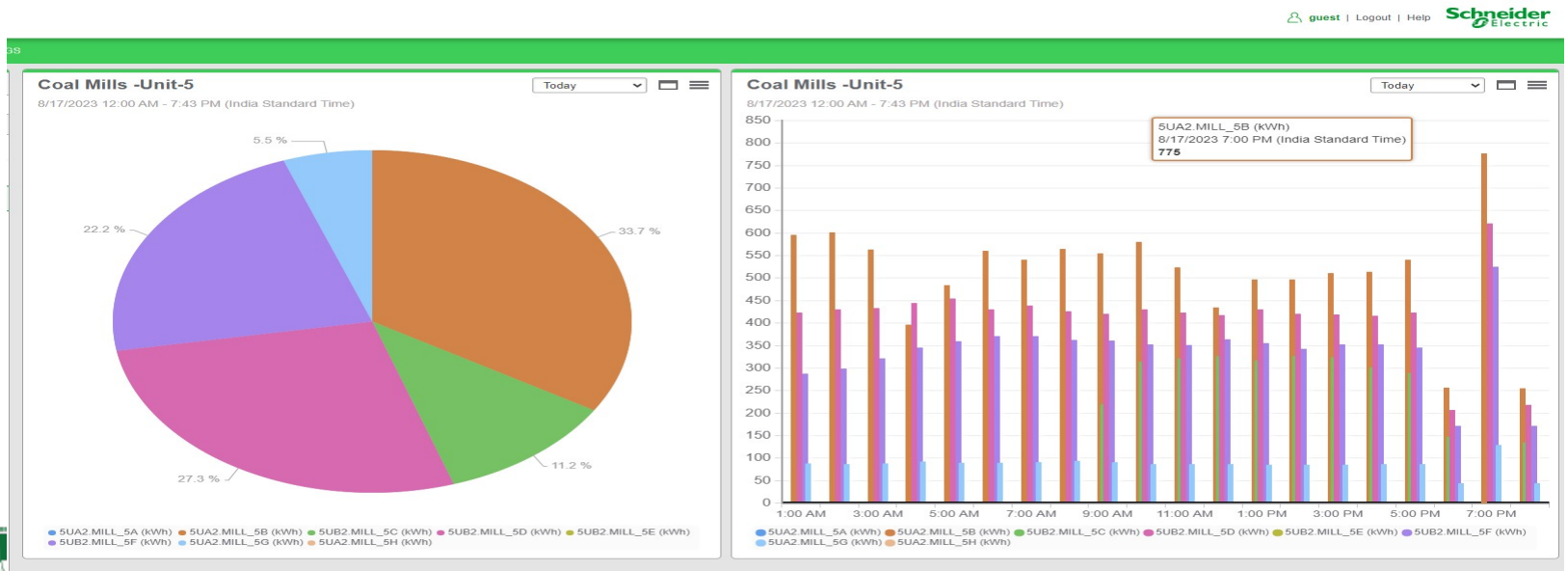
NTPC FARAKKA Achieved Benchmark in ASH Utilization among NTPC coal station 206.56% in FY22-23

WATER OPTIMISATION AT FARAKKA

- ZLD IMPLEMETED INSIDE PLANT BOUNDRY
- PLANT WATER DASHBOARD CREATED TO MONITOR REAL TIME WATER CONSUMPTIN
- MORE THAN 30 NOS WATER FLOW METER INSTALLED AT VARIOUS CONSUMPTION POINT
- SPECIFIC WATER CONSUMPTION ACHIEVED 3.36 LTR/KWHR AGAINST NORMS OF 3.5



Energy management system-Farakka



More than 400 HT & LT drives are Connected through EMS system.

Real time Aux power consumption are available.

Automatic APC Reports generated on daily/ hourly basis

PAT-FSTPS

PAT CYCLE	PERIOD	Aassessment Year	NHR TARGET	NHR ACHIEVED	ESCERTS
PAT CYCLE-I	2012-15	2014-15	**2574**	**2550.3**	**24041**
PAT CYCLE-II	2016-19	2018-19	**2551.58**	**2612.27/ 2639.47 Normalised**	**-109777**
PAT CYCLE-VII	2022-25	2024-25	**2585.45**		

FY 22-23 NHR = 2450/(1-0.775)= 2633 kcal/kwhr

NTPC FARAKKA is Notified by BEE under PAT cycle VII.

NHR Target of 2585.45 kCal/kWh in Assessment Year 2024-25,

Target improvement of 26.82kcal/kwh over baseline NHR of 2612.27 kcal/kwh.

PAT CYCLE-VII AUDIT is To be done in FY25-26

PAT VII Target –ENCON PROJECTS

S.N	Equipment/System	Activity Description	Responsibility	Energy Saving Potential/year	Target/status
1	VFD in CEP pumps of Unit 4,5 and 6	VFD installation in CEP of Unit-4,5, as per Energy audit	EMD	400x3x24*365*0.8= 8.40 MU	PR 400045820 Raised by EMD Target Dec-2023
2	Draft Power Reduction	APH Seal Replacment and Duct Leakages attend	BMD	21MU	22-23
3	MDBFP Ctridge Replacment in 200 mw units	MDBFP Ctridge Replacment in 200 mw units	TMD	3.5 MU	23-24
4	Unit Auxilliaries	Sustained part load operation on reduced demand. Single BFP operation is being practiced in Stg I units	OPN	0.5	23-24
5	Unit startup	With Single set of ID-FD-PA and With TDBFP	OPN	0.5	23-24
6	CW Pumps optimisation	During Winters and Part load operation season one CW pump can be stopped in st-1 units	OPN	2.88	23-24
7	Cooling Tower Capacity improvement by modified Spray nozzles	Modified spraynozzles to be fitted ij Unit-6 CT to improve water distribution. 1 deg gain may achieve in CW inlet temp	OFS	5 kcal/kwhr	23-24

Renewable Energy At NTPC FARAKKA

Type	Location	Installed Capacity	Annual Generation (in KWhr) FY 20-21	FY 21-22	FY 22-23
Rooftop Solar PV	MGR	10 KW	15811	14930	14850
Rooftop Solar PV	Admin Building & SWYD	90 KW	139640	148251	127884
TOTAL		100 KW	155451	163181	142724
CUF %			17.74	18.62	16.29

Upcoming Solar PV in FY 2024-25 : 200 KW SOLAR PV AT VARIOUS BUILDING INSIDE THE PLANT (Estimated Expenditure : 98 Lacs (Under Approval Stage)

Performance Review Structure -NTPC FARAKKA

Daily Audio Conference

Progress of Each Department Critical Issues -Review By Head of Project

Daily Planning Meeting

Daily Parameter Review for Ex. Daily Generation , Heat Rate Deviation , Commercial Performance , Maintenance Planning and Other Exceptions Being reviewed by Head of O&M .

Monthly Operation Review Meeting

Monthly Performance of Station and Critical Issues with Regional ORT Coordinator

Regional Operation Review Meeting

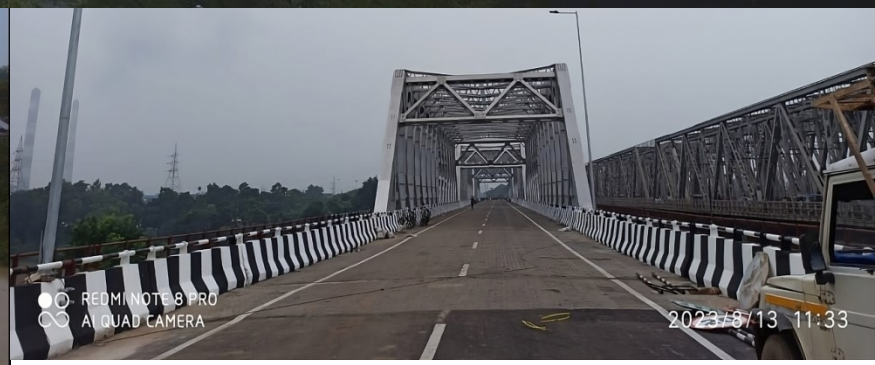
In Every Six Month , Station Operational Performance and Major Issues being Discussed with Higher Management .

SUBMERSIBLE PUMP SCHEME TO AVOID LEAN PERIOD LOSSES

Submersible Pump Scheme Installed on Feeder Canal for Lean Season March to May

TWO LANE BRIDGE

New Alternative 2 Lane Bridge was opened for public use on 15th August 2023



Awards

Environment Awards

- 22nd Annual Greentech Environment Award 2022 (Environment Protection Category).
- Green Maple foundation, Greencrest 2022 (Environment Management category)
- 12th Exceed Environment Award (Environment preservation)
- Green leaf Award 2022,Apex India Foundation (Environment Excellence category)

AWARDS AND ACCOLADES CURRENT FY

Station is recipient of:

1. **Award for its contribution in 26th National Exhibition Conclave in Kolkata.**
2. **14Th Exceed GreenFuture Gold Award in Environment preservation.**

Migratory Birds at NTPC DADARI

Thank You

NTPC FARAKKA

Website: www.ntpc.co.in | Email: jaiprakashverma@ntpc.co.in

Follow us on: /ntpc1 /ntpcltd1 /ntpclimited /Company/ntpc /ntpclimited