JOURNEY TOWARDS SUSTAINABLE FUTURE

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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

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						
	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

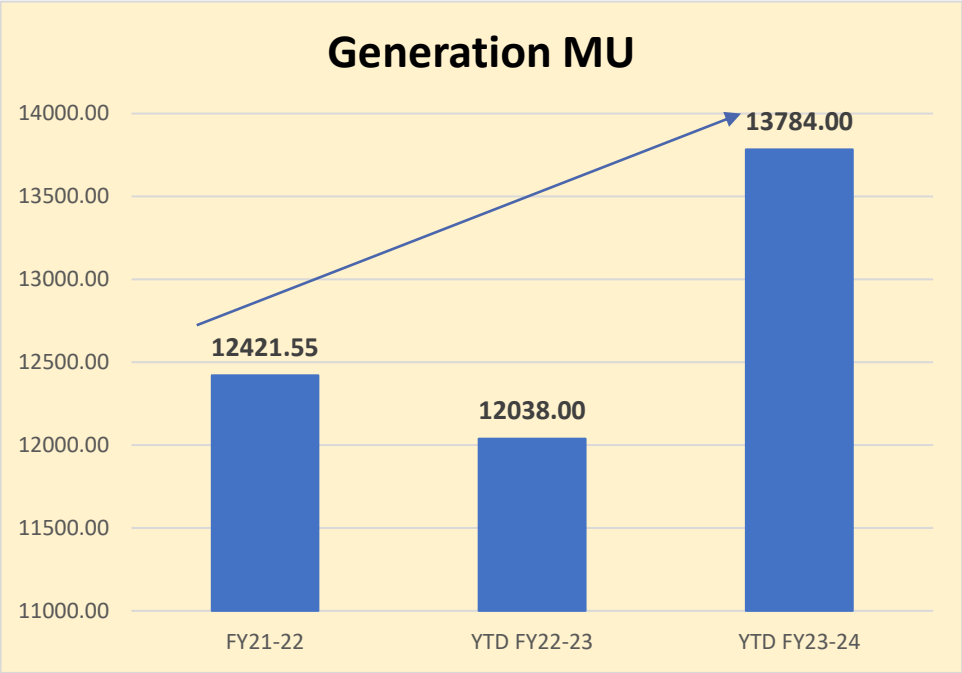
FARAKKA Station Highlights FY 23-24

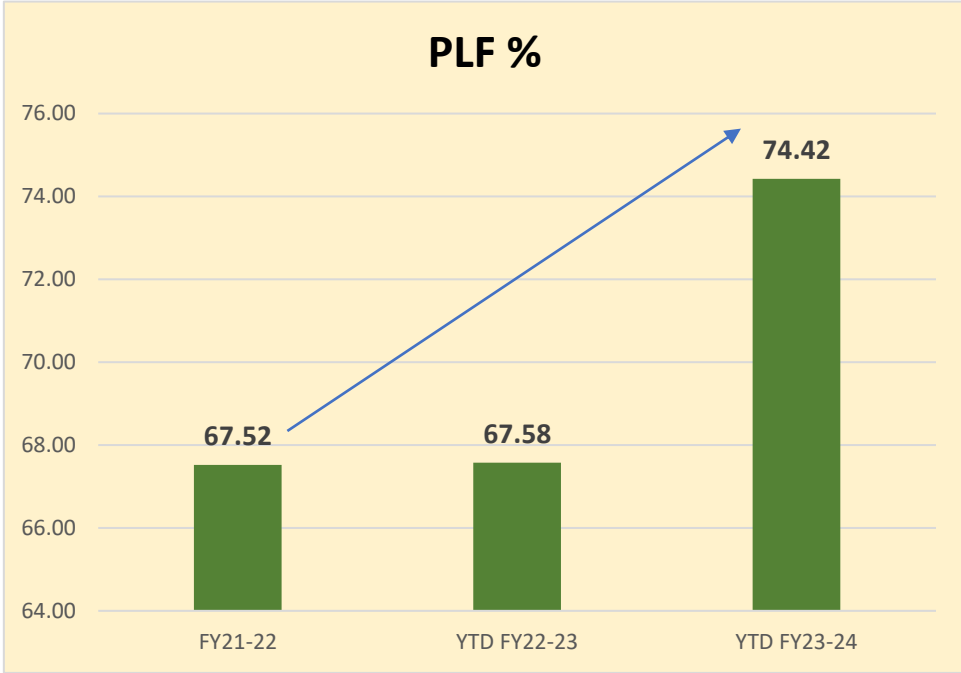
- FSTPS Generated 13784.22 MU in FY 23-24 with 74.73 % PLF
- Ash Utilization at 148.59% (44.33LMT) for FY 23-24.
- Specific water consumption upto July 2024 is 3.39 M3/MWhr against MOEF norm of 3.5 M3/MWhr.
- FGD : Erection in All 06 Units in progress, Stage-I,III Chimney Raft Completed.
- Approx. 8 LMT Fuel availability maintained in stackyard in FY.
- 03 Nos Major Overhaling completed in FY
- National energy management award 2023 –energy efficient unit

Farakka Operational Highlights

S.No	Parameter	Up to July 24	FY 23-24
1	Generation in MU (12657MU)	**4629.66**	**13784.22**
2	PLF in % (75%)	**75.29**	**74.73**
3	Availability including RSD %	**90.36**	**88.15**
4	DC % (85%)	**83.64**	**87.23**
5	Partial Loading Equip %	**0.444**	**1.83**
6	Planned Outage %	**6.04**	**8.43**
7	Forced Outage % (2.5%)	**3.59**	**2.56**
8	RSD %	**0.19**	**0.39**
9	APC Net % (7.3%)	**7.67**	**7.52**
10	Sp. Oil ml/ kwhr (0.6)	**0.40**	**0.82**
11	Heat Rate kcal/ kwhr (2424)	**2418**	**2425**

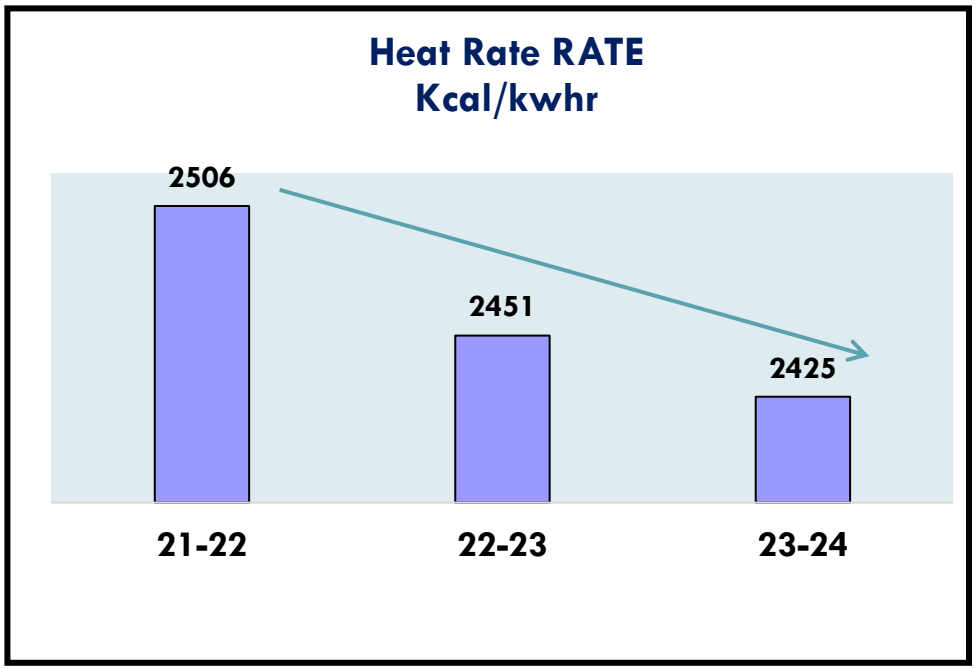
Electricity Generation MU last 3 years (FY 21-22 to FY23-24)





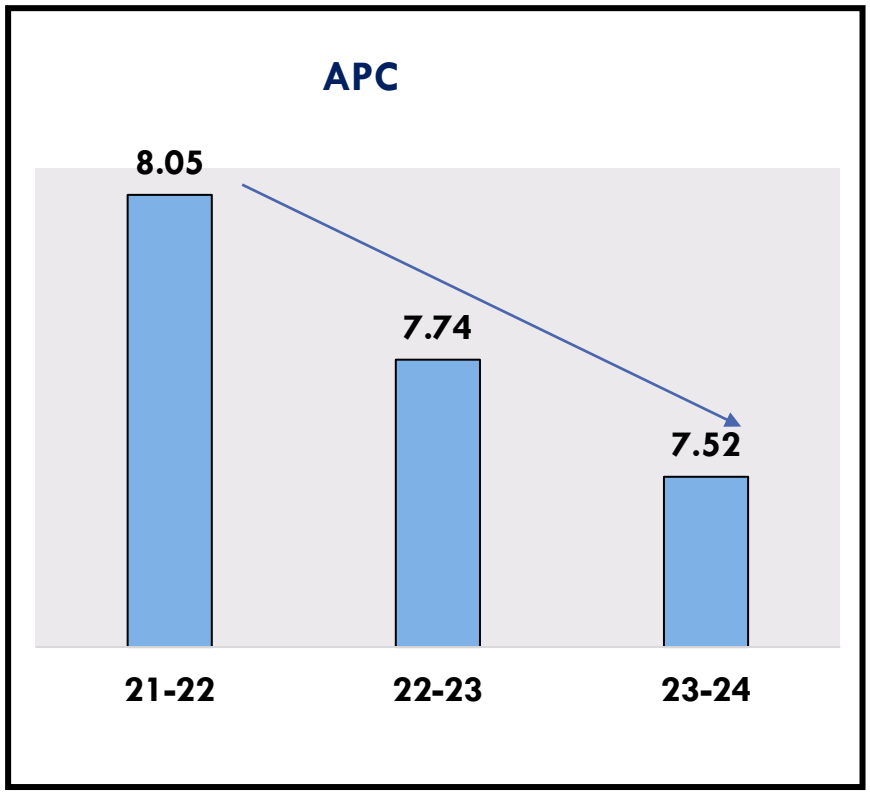
- Electricity Generation has been increased by reducing Gen cost.
- Improving Plant reliability by Executing 04 units Major Overhauls.
- Reducing Forced outages by improved maintenance practices
- Improved Fuel availability in all seasons.
- Generating as per Grid demand.

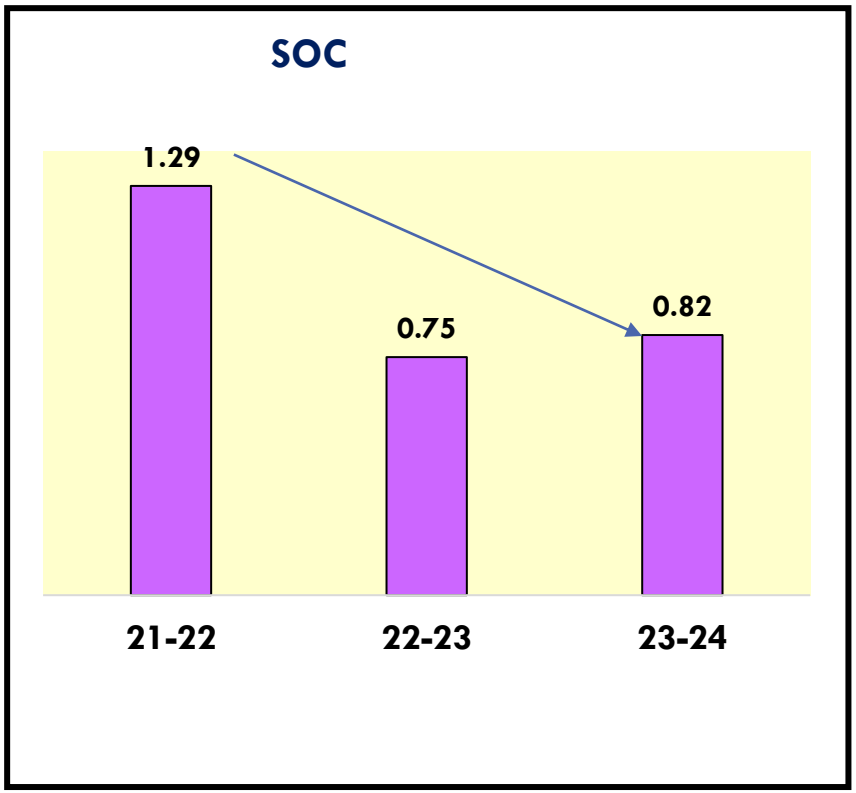
Sp. Energy Consumption in last 3 years (FY 21-22 to FY23-24)



- Specific Energy consumption reduced by 30 kcal/kwhr
- Unit-4 major Overhaul, HPT replacement, Boiler, APH OH
- Unit-6 HPT, IPT replacement, OH, Condenser HP Jet cleaning, APH Basket replacement
- Reduction in Cyclic DM consumption by arresting leakages
- Cooling Tower water distribution replacement.
- Unit-3 Turbine + boiler Overhaul
- Reducing Coal stacking losses- FIFO

APC & Sp Oil Consumption last 3 years (FY 21-22 to FY23-24)

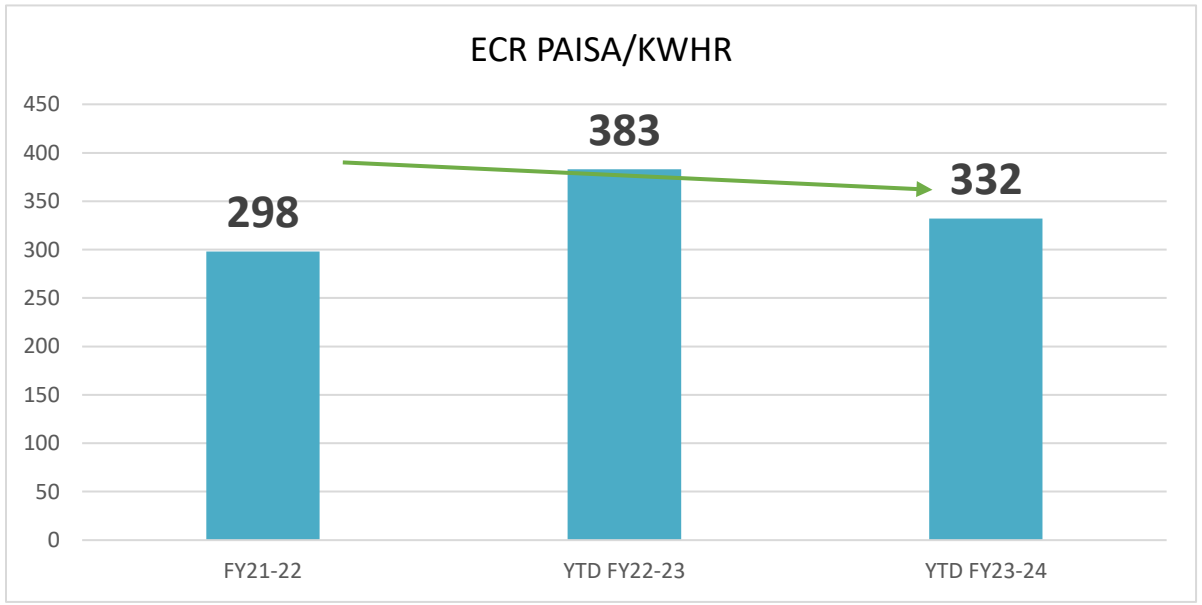




- Reduction in Draught power by 5050 kw/hr
- Increased Loading Factor
- Improved Coal quality
- improved CHP capability
- application of OLEMS for finding Gaps.
- Single Vacuum pump operation by arresting air ingress in condenser

- Optimization in startup time
- Reduction in mill C/O front fire boiler
- Milling system optimization
- Reduction in Shutdown power

Energy Charges for Last 3 Year's- Consistent Approach



- Cost of Electricity Generation has been reduced by13 % Over PY.
- Despite of increased coal cost world wide,Reduction in ECR has been achieved by optimization in coal sourcing from nearest coal mines and good quality coal, Only.6.9 % import coal used.

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 2023-24	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 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
	Power cycle piping Insulation replacement	9.0	0	5	20.1
	CT distribution spray nozzle replacement	1	0	4	10.0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Energy Saving projects implemented in last three years

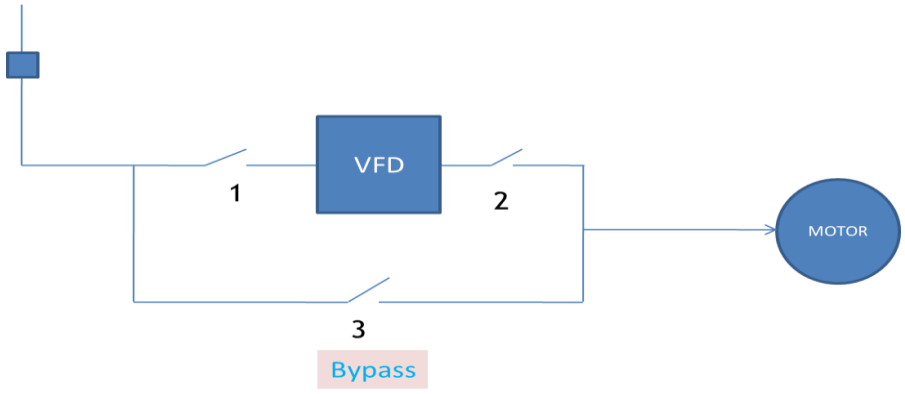
Year	No of Energy saving projects	Investments (INR Million)	Electrical savings (Million kWh)	Thermal savings (Kcal/kwhr)	Savings (INR Million)
FY 2021-22	Replacement of 250 watt sodium bulbs with 70 Watt LED	80.1	4.55	-	11.73
	CW pumps corrocoating for Energy saving, total power reduction achieved 29.5 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 2024
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

Renewables at Farakka

Type	Location	Installed Capacity	Annual Generation (in KWhr) FY 21-22	FY 22-23	FY 23-24
Rooftop Solar PV	MGR	13 KW	14930	14850	14800
Rooftop Solar PV	Admin Building & SWYD	90 KW	148251	127884	115881
TOTAL		103 KW	163181	142724	13068
CUF %			18.62	16.29	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)

Roof Top Solar

103 KW Operational

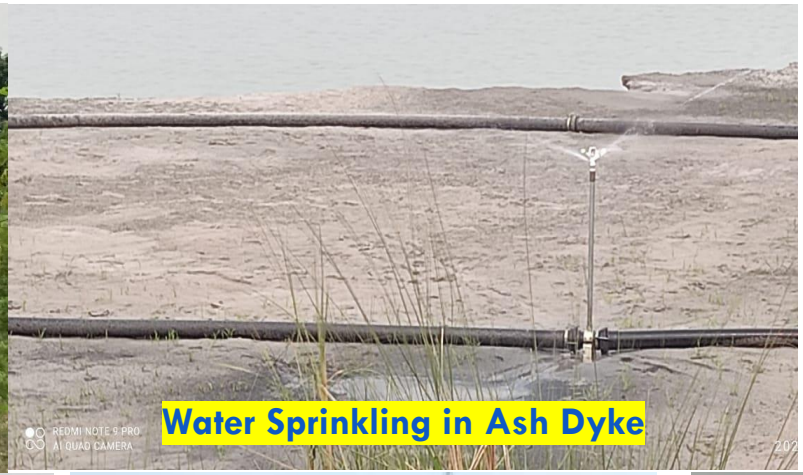
LED Lighting

Approx 50,000 Lightings Replaced with LED

Greenbelt Developments in Dykes

Environment Highlights 23-24


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

INITIATIVE TAKEN TOWARDS ENVIRONMENT SUSTAINABILITY

- **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 has been completed in Stg 1 & 2 . Additional fields erected in Stg 2 units**
- **All units has been made Biomass Firing Ready. Till now 72 MT biomass has been fired.**
- **Complete Switchover from HFO to LSHS in NTPC Farakka**

ASH UTILISATION

Ash Utilization

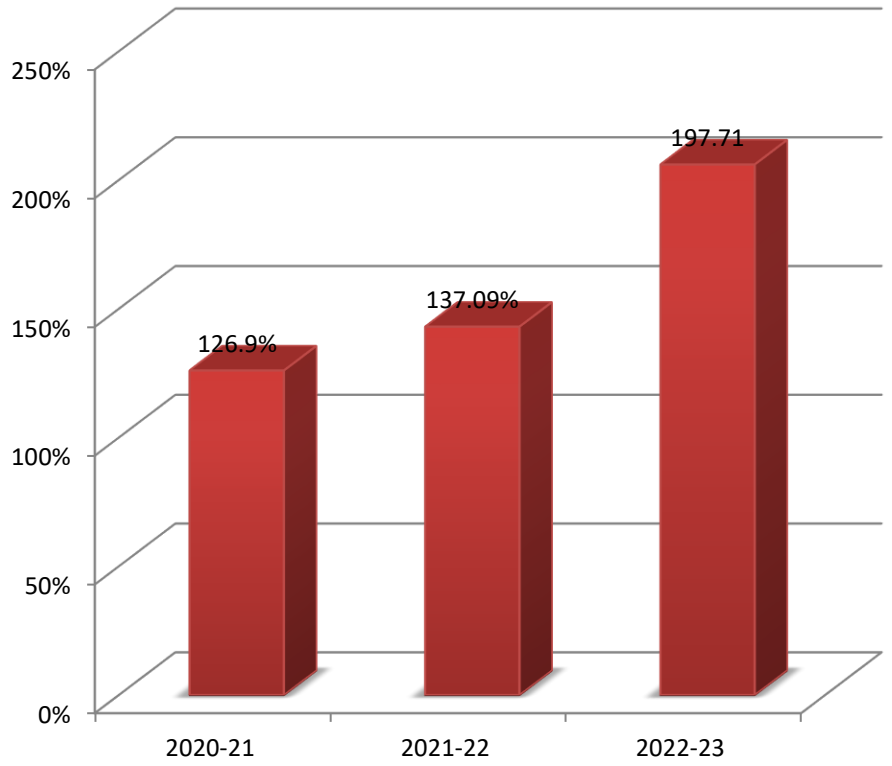
Particulars	UOM	2021-22	2022-23	2023-24
Ash Stock in Plant (yard + pond)	MTons	38246000	35782000	33775000
Ash Generated	MTons	2788125.81	2521188.15	2983512.67
Ash Utilization	%	137.09	197.71	148.9
Ash Utilized in manufacturing of cement/concrete – other similar products	MTons	248099.97	194918.52	196672.25
Ash Utilized in Fly Ash Bricks	MTons	37183.25	3954.52	1558.31
Ash Utilized in Land filling/ Low lying area development	MTons	0	0	0
Ash Utilized for rail/Roads embakement	MTons	2736245.5	4785852.91	4234088.02
Ash Utilization in Other Areas – Please mention below	MTons	560000	0	0
1. Ash dyke raising/Bottom Ash cover	MTons	240525.10	NIL	0
2.Cenosphere	MTons	102	NIL	NIL
3.Bottom Ash	MTons	NIL	NIL	778.38
4.	%			
5.	%			
Expenditure on Ash Utilization (annual)	INR (Lakhs)	22010	22505	30620

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

NTPC Farakka Creating Benchmark in Ash Utilization

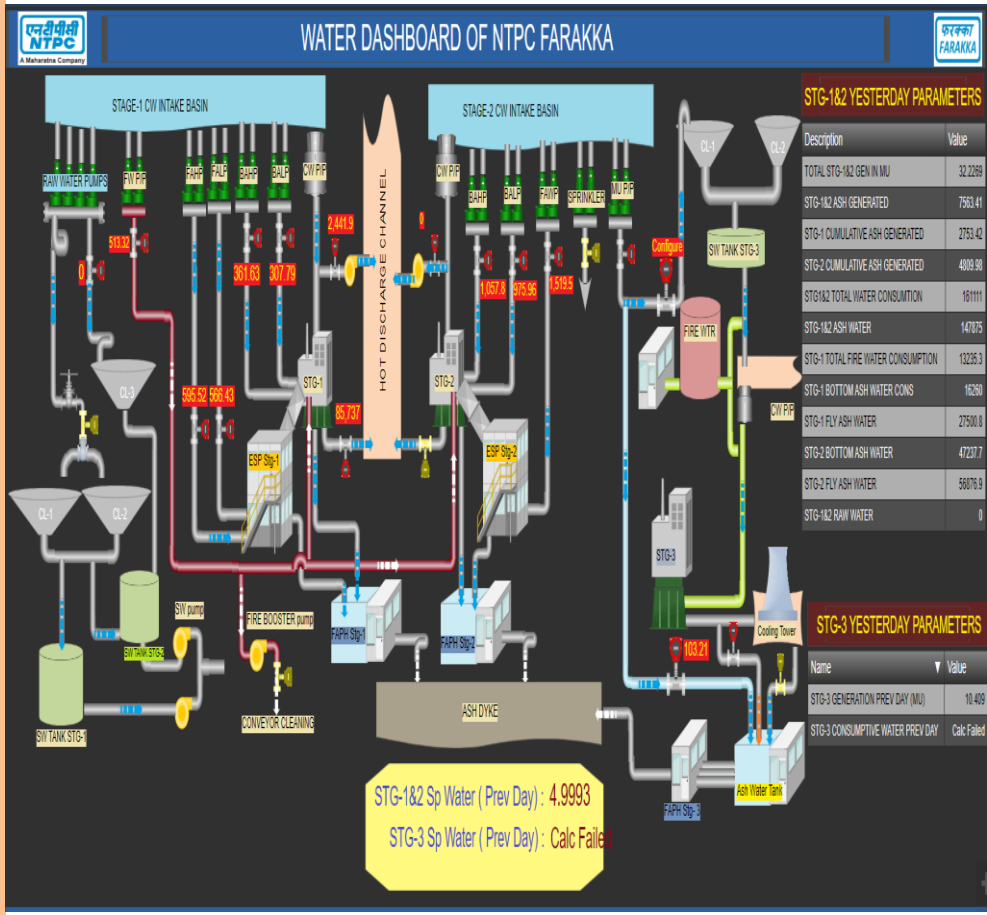
Faraka has 3 dykes Nishindra,Malancha and Kendua

- Dry Ash is directly utilised in Ambuja Cement Plant.
- Ash utilised in 7 ongoing NHAI Projects.
- Ash utilised for manufacturing Ash bricks.
- Ash utilized in land filling of low lying areas.
- Ash utilized in Roads/Rail embankment

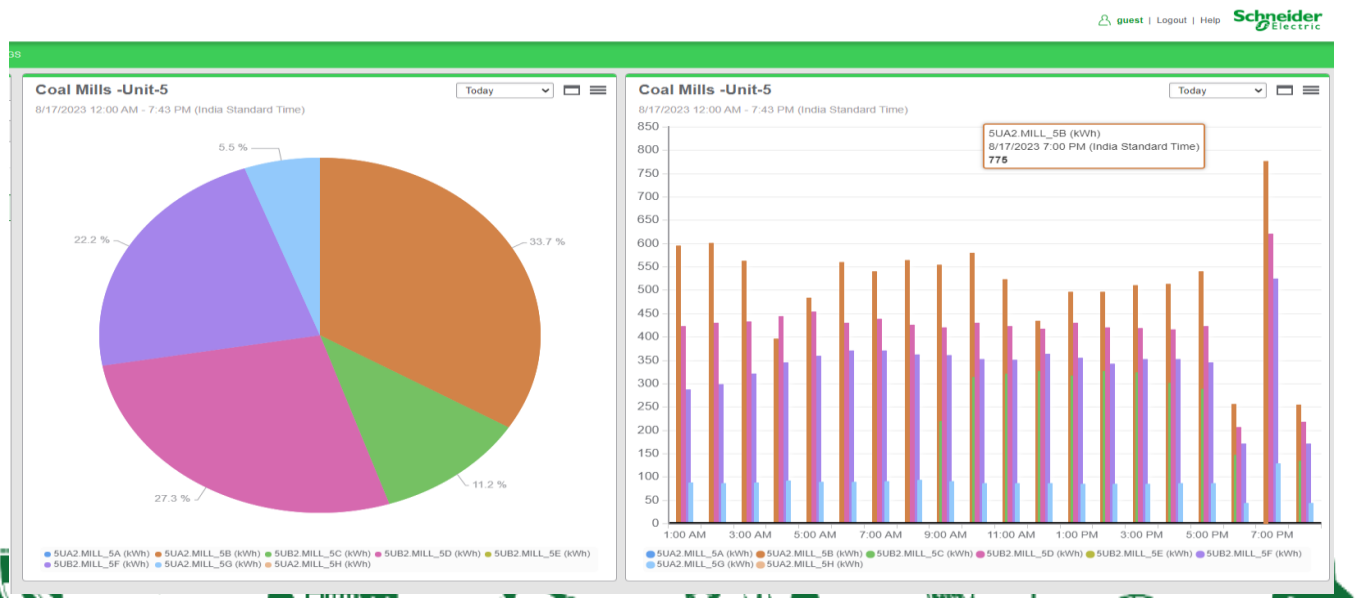


WATER OPTIMISATION AT FARAKKA

- ZLD IMPLEMETED INSIDE PLANT BOUNDRY
- PLANT WATER DASHBOARD CREATED TO MONITOR REAL TIME WATER CONSUMPTION
- 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

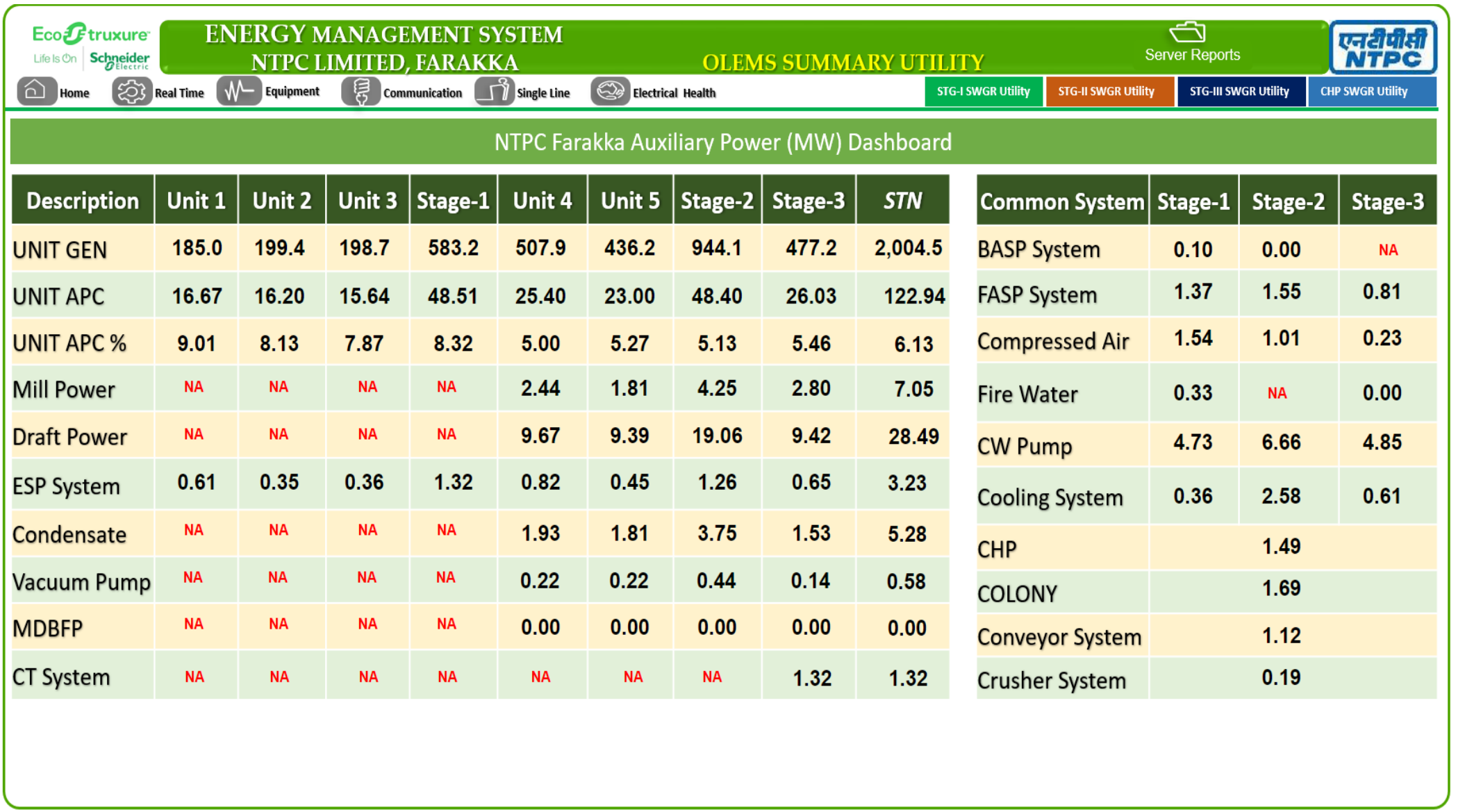


Energy management system-Farakka



- ❖ 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.
- ❖ Deviations discussed in daily planning meetings.

Energy management system-Farakka

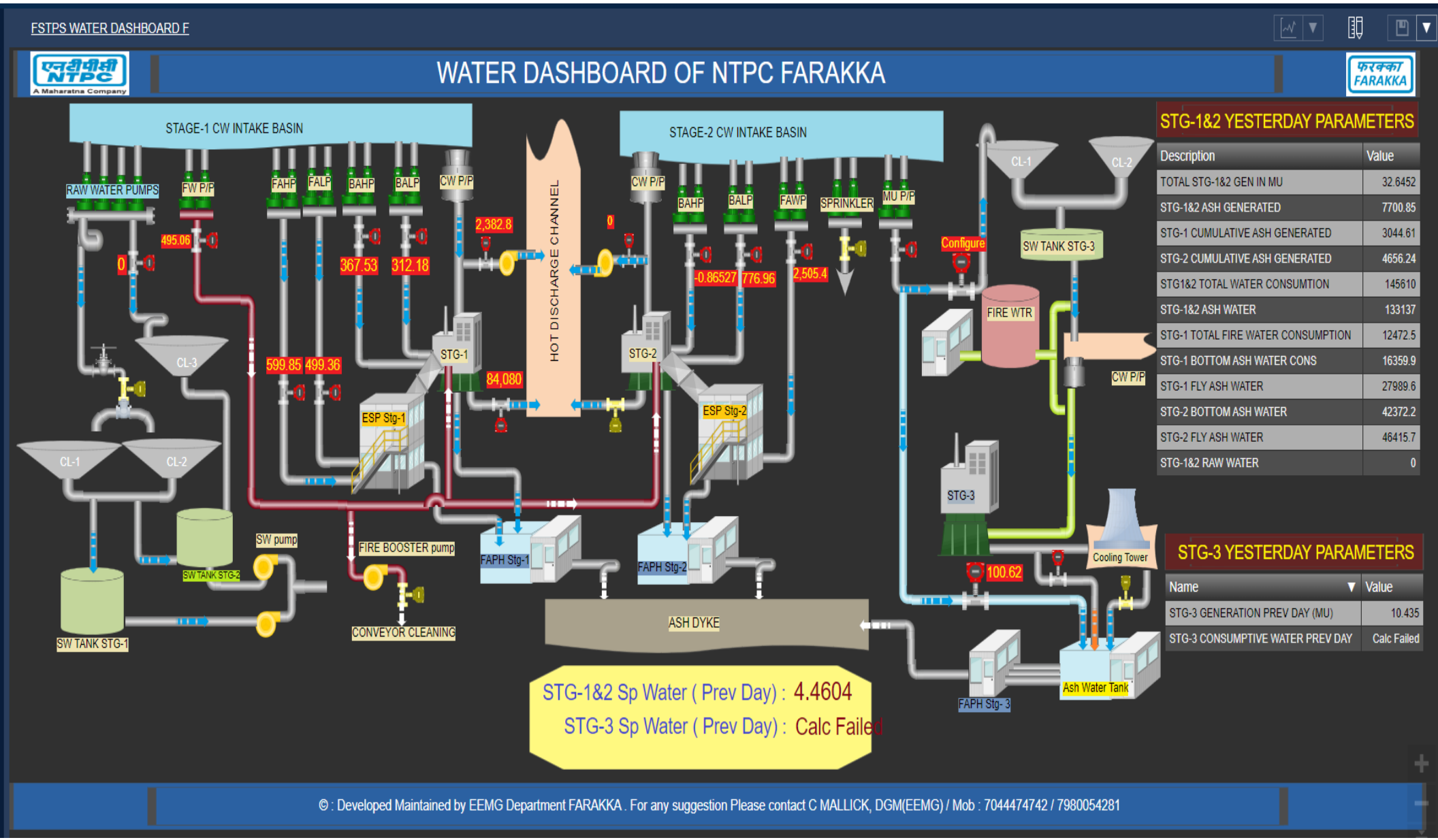


Description	Unit 1	Unit 2	Unit 3	Stage-1	Unit 4	Unit 5	Stage-2	Stage-3	*STN*
UNIT GEN	185.0	199.4	198.7	583.2	507.9	436.2	944.1	477.2	2,004.5
UNIT APC	16.67	16.20	15.64	48.51	25.40	23.00	48.40	26.03	122.94
UNIT APC %	9.01	8.13	7.87	8.32	5.00	5.27	5.13	5.46	6.13
Mill Power	NA	NA	NA	NA	2.44	1.81	4.25	2.80	7.05
Draft Power	NA	NA	NA	NA	9.67	9.39	19.06	9.42	28.49
ESP System	0.61	0.35	0.36	1.32	0.82	0.45	1.26	0.65	3.23
Condensate	NA	NA	NA	NA	1.93	1.81	3.75	1.53	5.28
Vacuum Pump	NA	NA	NA	NA	0.22	0.22	0.44	0.14	0.58
MDBFP	NA	NA	NA	NA	0.00	0.00	0.00	0.00	0.00
CT System	NA	NA	NA	NA	NA	NA	NA	1.32	1.32

Common System	Stage-1	Stage-2	Stage-3
BASP System	0.10	0.00	NA
FASP System	1.37	1.55	0.81
Compressed Air	1.54	1.01	0.23
Fire Water	0.33	NA	0.00
CW Pump	4.73	6.66	4.85
Cooling System	0.36	2.58	0.61
CHP		1.49	
COLONY		1.69	
Conveyor System		1.12	
Crusher System		0.19	

Energy Management System – Developed By Schneider Electric

Station water Dashboard



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 23-24 NHR = 2450/(1-0.775)= 2615 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 Replacement in 200 mw units	MDBFP Cartridge Replacement 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 spray nozzles to be fitted in Unit-6 CT to improve water distribution. 1 deg gain may achieve in CW inlet temp	OFS	5 kcal/kwhr	23-24

NEW INITITATIVES TAKEN FOR BETTER EFFICIENCY AND FLEXILISATION

- R&M of all Flame scanners and monitoring system of Stg 1 & 2.
- R&M of all Compressors of Stg 1 & 2.
- HMI Up gradation of Stg 1 & 2.
- Procurement of Bucket type Stacker cum Reclaimer.
- R&M of MGR Tracks.
- Implementation of Submersible scheme in Farakka to cater lean water season losses.
- Dry ash extraction system for Stg 1 & 2 units
- Replacement of 6.6 KV and 33 KV breakers
- Mega R&M of Switchyard for replacement of 400 kV circuit Breaker

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

- **24th National energy management**

  (Energy efficient unit).
- **Green Maple foundation, Greencrest 2022 (Environment Management category)**
- **12th Exceed Environment Award (Environment preservation)**
- **Green leaf Award 2022,Apex India Foundation (Environment Excellence category)**
- **22nd Annual Greentech Environment Award 2022 (Environment Protection Category).**
- **Award 2023**

AWARDS AND ACCOLADES CURRENT FY

Station is recipient of:

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

Migratory Birds at NTPC DADARI

Thank You

NTPC FARAKKA

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