25th National Award For Excellence in Energy Management 2024



TO ADTPS PRESENTATION

Ravi Patil - 9325119794 Suhas Patil - 9325119742



2 X 250MW COMM. YEAR – JAN/MAR 1995

LOCATION - 120 KMS FROM MUMBAI 24 KMS FROM NH8 TOTAL LAND – 850.32 H SUPPLY POWER TO MUMBAI

Resources & its sustainability



Current Year Performance

Key Performance Parameters	Indicator
Plant Load Factor (PLF)	78.46 %
Availability	91.88 %
Specific Oil consumption	0.171 ml/kwh
Aux Consumption without FGD	8.926 %
DM Consumption	0.398 %
Heat Rate	2268 Kcal/kwh

System Based Approach





Energy Consumption Overview





Energy Consumption Overview





Benchmarking -Regulatory Norms





Benchmarking With Peer Companies for FY 23-24



Description	UoM	ADTPS - Dahanu	GWEL-Warora	Reliance-Rosa	Lanco- Amarkantak	Balco- Korba
Availability	%	92.09	93.4	94.2	89.12	90.35
PLF	%	73.96	82.8	72.19	73.47	73.91
Loading Factor	%	80.32	88.7	78.1	82.44	81.8
Aux. Power consumption	%	9.06	7.63	7.64	8.44	7.79
Sp. Oil consumption	mL/Kwh	0.17	0.1	0.06	0.1	0.21
DM Water Make-up	%	0.36	0.14	0.34	0.28	
Heat Rate	Kcal/Kwh	2272	2307	2333	2395	2487

Investment in Energy Saving projects & Energy Saving

Investment in Lacs Saving in Lacs 3308 1564 1283 1268 1767 467 163 170 99.58 1 2019-20 2020-21 2021-22 2022-23 2023-24 2019-20 2020-21 2021-22 2022-23 2023-24 Investment of 54 Crs Saving of 48 Crs **Energy Saving in Mus** Saving of Coal (MT) 16.37 21612 20568 13.85 15270 8.66 6.22 5374 2290 1.47 2019-20 2020-21 2021-22 2022-23 2023-24 2023-24 2019-20 2020-21 2021-22 2022-23 **Energy Saving of 47 Mus** Coal Saving of 65117 MT

adani

Electricity

INDIA'S

POWER

Energy Saving projects implemented in last 3 years

Year	Name of Energy saving projects	Investments (INR Million)	Electrical savings (Million kWh)	Thermal savings (Million Kcal)	Total Savings (INR Million)
2023-24	6	17	13.85	52264	126.8
2022-23	2	0.1	1.47	8161	16.3
2021-22	4	176.7	16.37	78986	128.3

adani

Electricity

INDIA'S

POWER

FY 2022-23 – Shutdown Deferred as per SLDC due to constraints in Mumbai Transmission Network

Energy Saving Projects





Energy Saving Projects



FY 2022-23 – Shutdown Deferred as per SLDC due to constraints in Mumbai Transmission Network

Energy Saving Project	Savings /Year (Rs. Lacs)	Investments (Rs. Lacs)
Improvement in feed water temperature after attending parting plate leakage in HP heater -6	112	0
Reduction in ID Fan Loading after attending flue gas duct leakage	51	1
FY 2021-22		
Energy Saving Project	Savings /Year (Rs. Lacs)	Investments (Rs. Lacs)
Replacement of HP & IP Turbine - OH of LP Turbine	1657.00	1238.65
Reduction in slip loss of BFP 1B hydraulic coupling in U-1	101.00	0.63
De-staging -CEP 1B	3.54	9.0

Unit-2 shutdown – Servicing of HP and LP Turbine



Parameters	UOM	Data	
Net Saving in Unit Heat rate	Kcal/Kwh	20	
Net Saving/Year	Crs/Year	5.59	
CO ₂ Reduction	МТ	13460	

Parameters	Heat Rate in Kcal/Kwh
Before shutdown	2269
After shutdown	2249

Unit-2 shutdown - Reduction in ID Fan Loading after attending flue gas duct





INDIA'S

POWER

adani

Electricity

Parameters	UOM	Loading	Reduction in loading
Fan Loading before Overhaul	КW	5615	
Fan Loading after Overhaul	KW	4659	956
			THE SALES OF A DESCRIPTION OF A A DESCRIPTION OF A DESCRI

Opportunity Based Maintenance : Short shutdown



Parameters	UOM	Data	
Net Saving in Unit Heat rate	Kcal/Kwh	8	
Net Saving/Year	Crs/Year	2.24	
CO2 Reduction	MT	5384	



Parameters	HPH 6 Outlet Temperature in ° C
Before shutdown	235.38
After shutdown	246.94



Opportunity Based Maintenance : Short shutdown



Unit -1- Reduction in ID Fan Loading after attending seal leakages

Parameters	Unit	Before	After	
O2 Before APH	%	2.78	2.42	
O2 After APH	%	5.35	4.10	CAR BO
Seal leakage across APH	%	18.91	11.25	~ ~~~
APH Air Ingress in system	ТРН	151.93	94.50	

Parameters	UOM	Loading	Reduction in loading
Loading on ID Fan before work	KW	484	
Loading on ID Fan after work	KW	248	236

Capex for life extension



Major Capex Project	Cost in Rs Crs
Replacement of DDC & HMI system	38
Refurbishment of IP Turbine Module	15
Replacement of Boiler Eco and Reheater Coils, Coal burners	21
Refurbishment / Replacement of AHP equipment's like compressor, classifier, ash conveying pipes & valves, pumps & clinker grinder etc	16
Refurbishment / Replacement of major assemblies of CHP system like Wagon tippler, apron feeders, crushers, locomotive, belt conveying system	26
Construction of Ash Pond No 04	46
Repair Plant Buildings, Machine Foundations, Civil Structure	21
Renovation of Township Residential Quarters	15
Upgradation of IT network	12





ADTPS proposes Rs. 423 Crs for the life extension of ADTPS units.

Capex for life extension

Major Capex Project	Cost in Rs Crs
Replacement of DDC & HMI system	38
Refurbishment of IP Turbine Module	15
Replacement of Boiler Eco and Reheater Coils, Coal burners	21
Refurbishment / Replacement of AHP equipment's like compressor, classifier, ash conveying pipes & valves, pumps & clinker grinder etc	16
Refurbishment / Replacement of major assemblies of CHP system like Wagon tippler, apron feeders, crushers, locomotive, belt conveying system	26
Construction of Ash Pond No 04	46
Repair Plant Buildings, Machine Foundations, Civil Structure	21
Renovation of Township Residential Quarters	15
Upgradation of IT network	12



भारत सरकार Government of India विद्युव मंत्रालय Ministry of Power केन्द्रीय विद्युव प्राधिकरण किन्द्रीय विद्युव प्राधिकरण वापीय परियोजना जवीनिकरण एवं आधृनिकीकरण प्रभाग नामगा शिल्हार Renovation & Modemization Division

No.: CEA-TH-14-24/5/2022-TRM Division/235-335 Dated 20.01.2023

विषय: Renovation and Modernisation (R&M) of aged coal-fired Thermal Power Stations (TPS) - reg.

The Govt. of India is striving to provide affordable electricity on 24x7 basis to common citizen. However, the country is witnessing huge energy demand post pandemic which is projected to surge at all-time high in coming summer of 2023 and beyond. Therefore, the role of thermal fleets including old thermal units becomes crucial in order to support renewable integration.

Hon'ble minister in the meeting held on 06.12.2022 (copy enclosed) advised not to retire any thermal units and urged for carrying out R&M for life extension and improve the flexibility and reliability of thermal units considering the expected demand scenario and availability of capacity in future. It may be noted that about 15-16 GW of new thermal capacity is expected by December 2023. Accordingly, R&M for life extension is to be considered after December 2023. However, RLA and other pre-R&M/LE related preparatory works may be taken up in the meantime.

Therefore, it is advised to all power utilities not to retire any thermal units till 2030 and ensure the availability of units after carrying out R&M activities, if required.

> বি सन्मिक estal 2022-(B C Mallick) / (बी सी मसिक) CE (TPRM) / सीई (टीपीआरएम)

To: As per the list.

Copy for information: 1. Secretary (Power), MoP 2. Chairperson, CEA

Member (Thermal), CEA

ADTPS proposes Rs. 423 Crs for the life extension of ADTPS units.



144

Innovative Projects

Innovative Project -1

QR Code System for Electrical Isolation of Equipment.

Previous Procedure

Traditional method posing safety risk may lead to fatal accident:





Unit Controller

Previous Procedure



Unit Controller

Required Isolation Equipment : Chiller Motor 3 Unit : 1





INDIA'S

UTILITY



22

adani

Electricity



Risk Scenario : Incorrect Unit



U#1

-4

Chiller Motor -3

adani

Electricity

24

IND/A'S

JTILITY

Human Error





- Equipment PTW -TAG
- Electrical modules

System based Confirmation to Operator through

- Power Apps
- Microsoft Teams

adani

Electricity

IND/A'S

Implemented Project



Unit Controller







In	nplemen	ted	QR CC Additi	DE on		U#1		INDIA'S POWER UTILITY	adani Electricity
	adani Electricity		а					Vec	
Order No	400000388764		Order No	40000388764	-			-	
Order Description	ISOLATION FOR DH-101122106		Order Description	ISOLATION FOR DH-101122106			. C *0. L . C *0	11 9 9 1 7 9	
Planner Group	ELM	1	Planner Group	FIM					
Issue Date	10.07.2023	0	Issue Date	10.07.2023					
U Jity Date	12.07.2023	1	Validity Date	12 07 2023	S. Mar	VIE			
Equip. Description	Central AC. chilled water mot-3 U# 1		Equip. Description	Central AC. chilled water mot-3 U#					
Isolated Equipment	MODULE OFF AND FUSE REMOVED Central / mot-3 U# 1	AC. chilled water	solated	MODULE OFF AND FUSE REMOVED					
Tagging	E-YES		Faccing	Central AC. Chilled water mot-3 U# 1					
Signature			Signature	E-TES		U#2			
Name(TGCM)	Vincy D'Silva VINCY		lame(ISOL)	p.N. Kadı.					

Implemented Project





Implemented Project

STEP 1 – MOVE to LOCATION







30

Implemented Project

STEP 2 – SCAN TAG

	adani Electricity	adani Electricity			
Order No	400000388764	Order No	400000388764		
Order Description	ISOLATION FOR DH-101122106	Order	ISOLATION FOR DH-101122106		
Planner Group	ELM	Planner Group	ELM		
Issue Date	10.07.2023	Issue Date	10.07.2022		
C Jity Date	12.07.2023	Validity Date	12.07.2023		
Equip. Description	Central AC. chilled water mot-3 U# 1	Equip.	Central AC. chilled water mot-3 U#		
Isolated Equipment	MODULE OFF AND FUSE REMOVED Central AC. chilled water mot-3 U#1	Isolated	MODULE OFF AND FUSE REMOVED		
Tagging	E-YES	Togging	Contral AC. Critited water mot-3 0#1		
Signature		Rissature	E-YES		
Name(TGCM)	Vincy D'Silva VINCY	I Jame(ISOL)	Dat		



adani **Implemented Project** IND/A'S POWER Electricity U#1 • -4 STEP 3 - SCAN MODULE LLED R PUMP U#2 = **III**-4 31







adani

IND/A'S








Implemented Project





adani

Electricity

INDIA'S

POWER UTILITY

Benefits



Inline with Organization Goal of Zero Harm



Accurate Isolation of Equipment's

A CARLES AND A CARSEN



Elimination of Human Error



Eliminates risk of occurrence of accident and equipment damage



Improves Brand Image

Replica is possible in other Power plants

Use of Digital Camera for Internal Inspection of Coal Mills



Problem: Maintenance persons were entering into confined space of coal mill for internal inspection, having exposure to potential hazards of coal smoldering.

Solution : Use of Digital Camera for Internal Inspection of Coal Mills

Benefits:

- This eliminated entry of maintenance person in confined space and thereby enhancing safety of human beings.
- This eliminated hazards like suffocation, unconsciousness, exposure to dust and heat.



Replica is possible in other Power plants

Online detection of Boiler clinkering



Problem

Boiler clinkering identified by Local Operator by experiencing local round and Boiler Desk Engineer does not get any information & results less time to initiate necessary steps for safe boiler operation

Solution

Online vibration system installed at elliptical door of boiler, which provides alarm indication in PCR through Sequence of Events



Online detection of Boiler clinkering



Replica is possible in other Power plants

Monitoring system for Detection of Boiler



		CIMMES -3	hystem he
154.69 MW 103.73 Kg/cm2		.797 Amp	149 MG/NN
IO O OSU PUMP A(HPBP)	N ON ON	15 Minutes *	
10 0 CLINKER AT BAH 10 0 CLINKER AT BAH 10 0 CLINKER AT BAH	N YES YES N YES		
10 S 10 S 10 OSU PUMP A(HPBP)	N. HIGH		
10 0 CLINKER AT BAH 10 0 CLINKER AT BAH 10 0 DEBRIS FILTER PASS A GEAR DRIVE	N YES YES OFF		
0 0 GG GREASE PUMP MILL EF /0 0 GG GREASE PUMP MILL EF	N. ON OFF		09-05 20 2 (15-00) 20 (15-00) 20 2 (15-00) 20 (15-00) 20 (15-00) 20 (15-00) 20 2 (15-00) 20 (15



43

ATT

THE P

Renewable Energy



Solar Roof Top Generation	Solar Generation
Admin building roof top solar - MWH	60.94
Vangaon AAQM Roof top - MWH	0.988
Ashagad AAQM Roof top - MWH	1.396
Total	63.32







Installation of Floating Solar Panel on backwater channel (Project is under study)



Area identified for Solar Installation :

- Solar plant installation on Water bodies 200 Acres (50MW Capacity)
- Roof Top Solar 03 Acres (0.75 MW Capacity)

Expected Benefits

- Capacity Utilization Factor (CUF) 17%
- Expected Generation 76 Mus
- Impact on APC reduction 2.17% (@ 80% PLF)

Ash Management :





Ash Management :







Ash utilization is incompliance with MoEF & CC Notification

NABL Accreditation for Ash Testing Laboratory





Environmental Initiatives:





Green Belt Development in Plant (54%) & Ash Ponds



Use of Washed Coal since 1997 & blended with Imported Coal

6



ZWTL -Diversion ratio – 99.96%





Sea Water FGD Since 2007



<u>Growth with Sustainability | Adani</u> <u>Transmission</u> (adanienergysolutions.com)

Environmental Initiatives:





Mangrove Plantation > 20 Million

Setting up Ambient Air Quality Monitoring



Rainwater Harvesting- Roof top water collection

Drip Irrigation for entire Horticulture & Floriculture

<u>Microsoft Word - AESL - AGM BRSR</u> <u>dispatch SE - 27.05.2024.docx</u> (bseindia.com)

Environment Performance





ESG Performance



Renewable energy share increase to 35% in overall electricity mix. CDP Climate Change 2023 score improves to 'B' from 'D' due to prompt actions on CC.

Secured a 'B' rating in the CDP Water Security 2023 score. Firmly achieved 'B' rating in the CDP Supply Chain Engagement score(global average - C) ESG score improves to 25.3 from 32.8, securing place among top 30 global utilities.

Biodiversity Study by Cll





Three-season study carried out from Sep 2021 to Aug 2022.

ADTPS recorded rich faunal and floral diversity with a score of 66/100.

225 floral and 144 faunal species recorded.

25 migratory birds including flamingoes observed.

Successful completion of PAT-1 & PAT -2 Cycle



Parameters	UOM	PAT-1	PAT-2
Target SNHR	Kcal/Kwh	2523	2519.42
Achieved SNHR	Kcal/Kwh	2511.71	2495.4
SNHR Gain	Kcal/Kwh	11.29	24.02

Gain of 4591 and 8749 Escerts



Water Management





Efforts taken for reduction in plant water consumption:

 \geq Installation of 50 no. of flowmeters in various buildings

>Availability of building wise water consumption data at a glance on MS TEAMS platform

>Various water project are identified, and separate budget @ 20 Lacs is provided

Best Practices adopted at AD

Modular Concept to Reduce Maintenance Downtime





- Use of modular concept that allows the replacement of major assemblies in a minimum amount of time and expenditure (e.g. HP turbine module, CW debris filter, Primary & Secondary fans rotor, Boiler feed pump cartridge, vacuum pump, CW pump)
- Modular Scaffolding for Boiler Overhauling

Readiness to Flexible Operation





Flexibility assessment study up to 40% load, carried out in Sep-2019 under guidance of OEM (M/s BHEL).



Upgradation of existing Governing system with MAX DNA for fine control of turbine control valve.



Upgraded RFGMO installed in both the unit and same is in service 24*7.



Digital flame scanners installed in unit # 2 & planned in next overhaul in unit # 1.



Our own training center is having simulator facility which is being used for hands on experience of flexible operation to desk engineer.



During every unit shutdown opportunity, flexible operation limiting load, without oil support is exercised

Residual Life Assessment (RLA) Study



RLA study conducted after every 50,000 Hrs. operation of

REPORT ON REMNANT LIFE ASSESSMENT OF BOILER UNIT 2-250MW (IBR REG NO. MR-12309) AT ADANI DAHANU THERMAL POWER STATION AS PER IBR/1950/REGULATION 391A(b)(I) TABLE-1

CLIENT: M/S ADANI ELECTRICITY MUMBAI LIMITED REPORT NO: V46275



Unit				
Major Equipment	Remaining Life in Years			
HP Turbine	24			
IP Turbine	20			
LP Turbine	20			
Turbine Valves	22			
Main Boiler	17			
Generator	14			
Exciter	17			

Digitalization





Installation of EV charging station





Electric Vehicle Running KMs				Savino		
Year	E Vehicle-1	E Vehicle-2	E Vehicle-3	Total Running KM		CO ₂ Saving in Kg
FY 23-24	11578	18481	16123	46182	3080	8000

Adani Workplace Management System (AWMS)





Celebration of Energy Conservation Week





Celebration of Energy Conservation Week



Urja Samwad



Energy Management System





Received Certification on $\mathbf{1}^{\text{ST}}$ Day of Launch

Realtime monitoring – ELAN/HMI System

Building Energy Consumption Reduction by 27%

BEE Certified Energy Auditors – 19 Nos

Energy Management System





MIS for Performance Monitoring





CSR- Health, Education & Livelihood.





Learning Implemented from CII Forum

Project :Reduction in slip loss of BFP hydraulic coupling



Parameters	UOM Loading		Reduction in loading	
Before Modification of Hydraulic coupling	KW	5869		
After Modification of Hydraulic coupling	KW	5317	552	



NET ZERO commitment AEML Sustainability KPIs & Status



FY2024

34.35%

RE - 3710.88 MU

AEML adopted Sustainability Linked Targets with following KPI's with financial penalty for

FY2022

8.12%

FY2019

(Baseline)

3.01%

KPI 1: Increase Renewable power mix in the overall power purchase mix

SPT 1: To Attain at least 30% by FY2023 and 60% of renewable power procurement mix by FY2027

		lotal – 9995.5		52 MU	Iotal – 10	804.65 MU	
1. S. C. S. S. S.							
ntensity		FY2019 <u>(Baseline</u> <u>)</u>	FY202 0	FY2021	FY202 2	FY202 3	FY2024
ty (Scope 1	GHG tCO2e	3750069	337001 3	320202 0	323782 6	331015 9	3082158
027 and 60%	EBITDA Rs Cr	1664	1882	2078	2083	2381	2353.70
seline year)	Emission Intensity (tCO2e/ EBITDA in Rs Cr)	2254	1791	1541	1554	1390	1309.49
ESG Commitm	nents on track thro Taken	ough vario	us Meas	ures 3%	31.04 %	38.32%	41.90%

FY2023

30.04%

RE - 3002.41 MU

KPI 2: Reduction in GHG Emission Intensity

(Scope 1 and 2)

SPT 2: To Reduce GHG Emission Intensity (Scope 1 and 2) by 40% by FY2025, 50% by FY 2027 and 60% by FY2029, compared with FY2019 (Baseline year)
Awards and Recognition



Awards



Excellent Energy Efficient Unit POWER SECTOR



ani Dahanu Thermal Pow Station, Dahanu

- Last year achievement "Excellent Energy Efficient Unit" award from CII.
- Proclaimed as the "National Energy Leader" for the fourth consecutive year.



Awards





We're listening

