UltraTech Cement Limited
Unit: Rawan Cement Works-Captive Power Plant

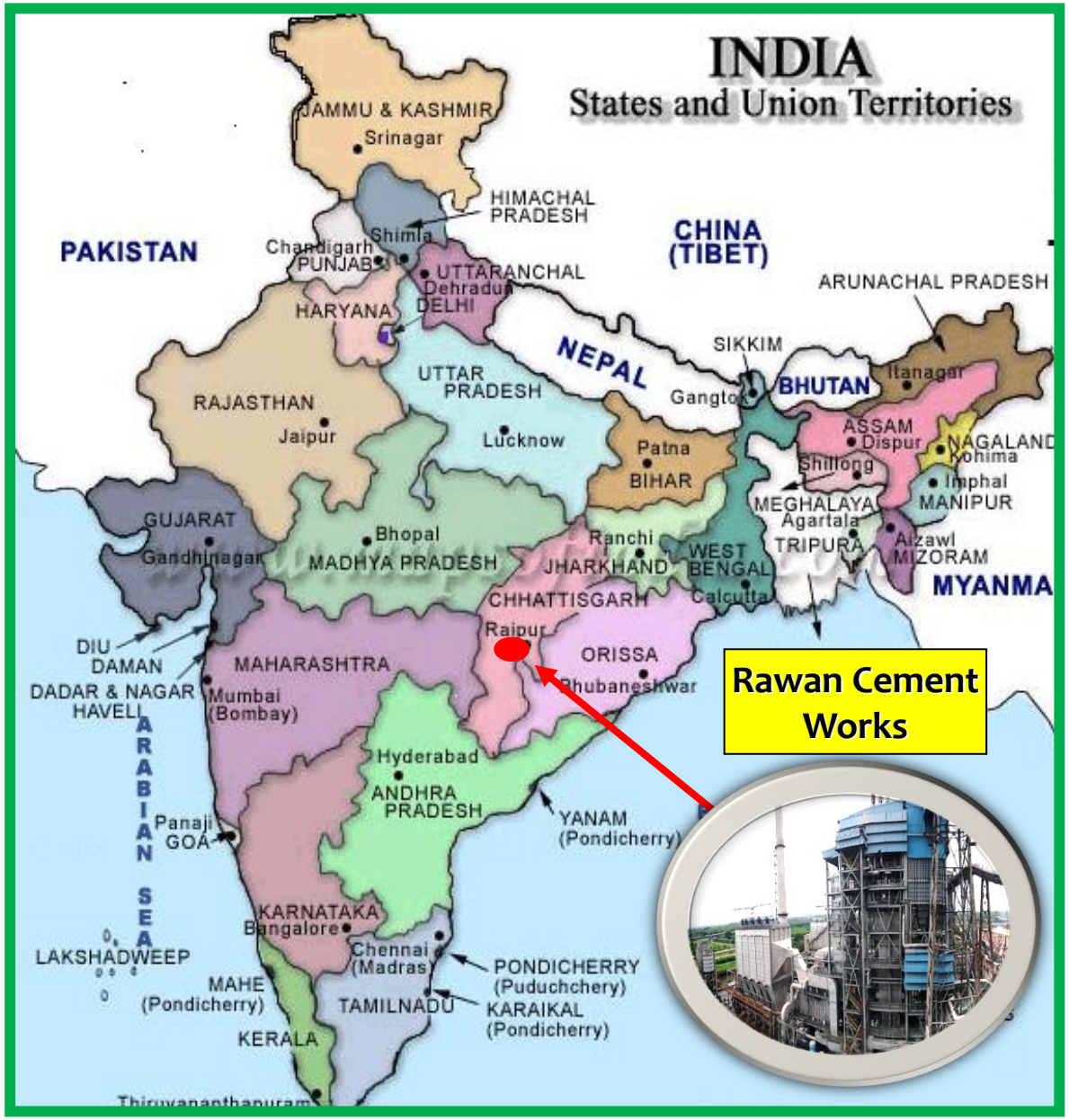
Welcome to CII

22nd National Award for Excellence in Energy Management 2021

Team Members:

1. Mr. Shriprakash Gupta- (Sr. Gen. Manager & Energy Auditor)
2. Mr. Pawan Potghan – (Manager Operation)
3. Mr. Raghvendra Mishra – (Sr. Engineer & Energy Auditor)

Company Profile



UltraTech Cement Ltd - Rawan Cement Works

- UTCL : A part of ABG which is the best employer in India and Asia Pacific region.
- Rawan Cement Works : An Unit of UTCL
- 55 MW capacity Captive Power Plant (25 + 30)
- 15.18 MW capacity WHRS unit.
- 10.8MW Solar Power Plant.
- Fullest compliance to Environment Norms.
- Certified with ISO 9001, 14001, OHSAS 18001, ISO 27001, SA8000 standards & Excellence in Energy Efficient.
- Adopted World Class Manufacturing Excellence Model.

Business Continuity plan against Covid-19: RWCW TPP

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❑ Plant operation continuity during Covid-19 scenario :

- Safe shutdown of plant & Asset preservation effectively.
- Safe restoration of the plant post lockdown (1st May'20 onwards.)
- Sustained continuous & reliable operation of TPP/WHRS.
- Practicing "Doing more with less" to optimize the productivity.
- "Idea generation" through brainstorming within team.

Project

R o c K

Rising Over COVID Knockdown

❑ "Vajra" at TPP & WHRS

- ❖ "Vajra" structure implemented at TPP & WHRS in line with cluster guidelines to protect business continuity.
- ❖ Total 04 groups created for ensuing continuity of plant operation. (No overlap of any member)
- ❖ Total 31 "Vajras" created covering TPP & WHRS out of these four groups.

Precautionary practices against Covid-19 Avoiding hand

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Stand by facility for TPP CCR operation & PTW window

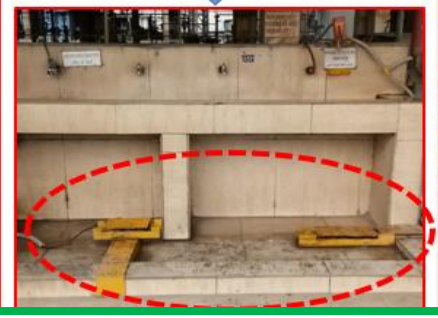
BeSafe BeSmart

Giving thrust to "No hand touch" practices

BeSafe BeSmart

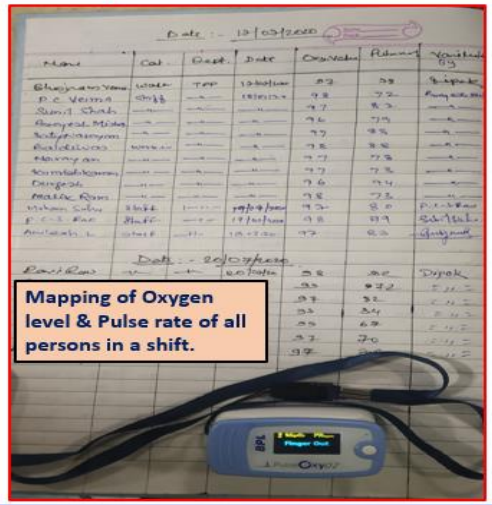
Provision given for foot operated door puller.

Foot operated wash basin/ drinking water point



Safety precaution practices against Covid-19

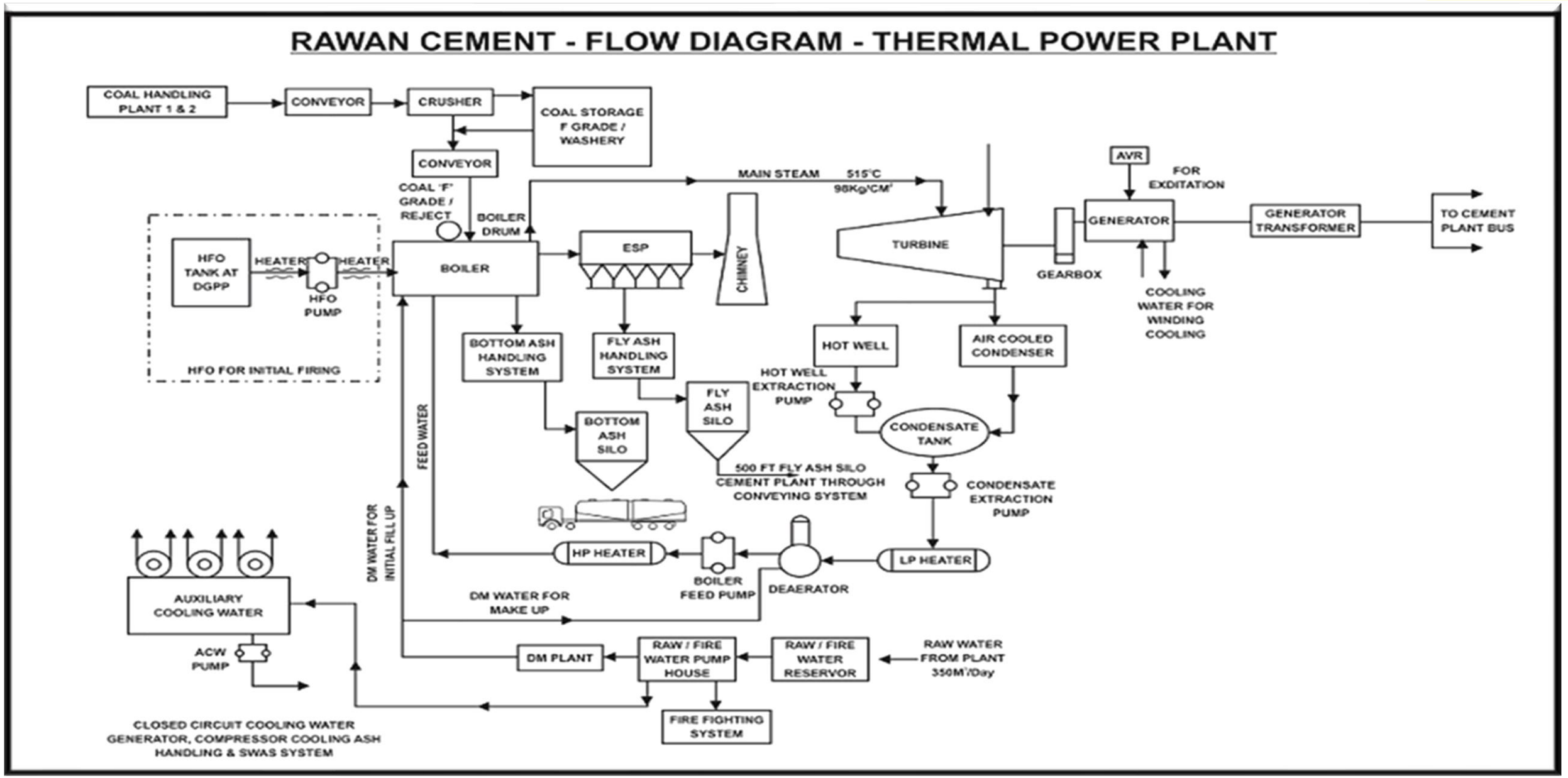
BeSafe BeSmart



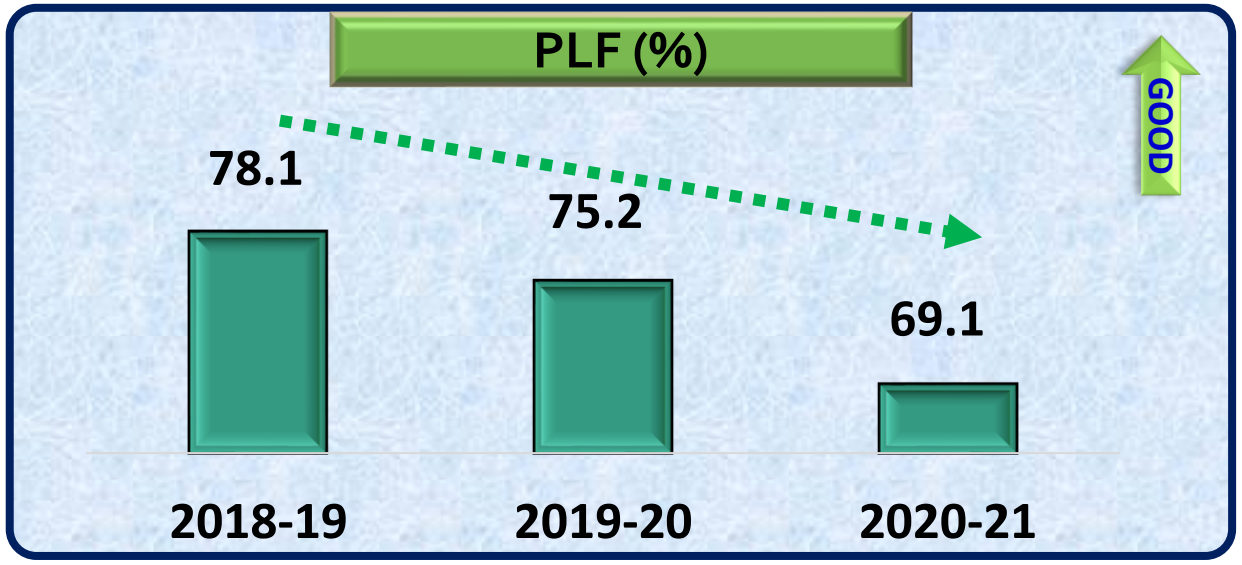
Mapping of Oxygen level & Pulse rate of all persons in a shift.

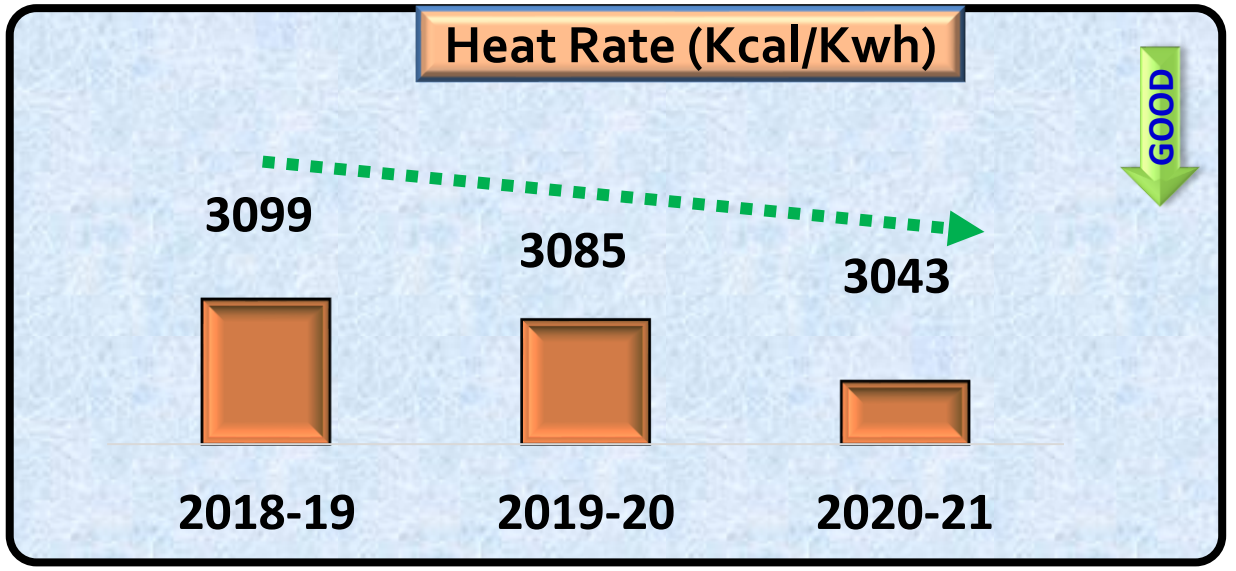
Sanitization of CCR in each shift

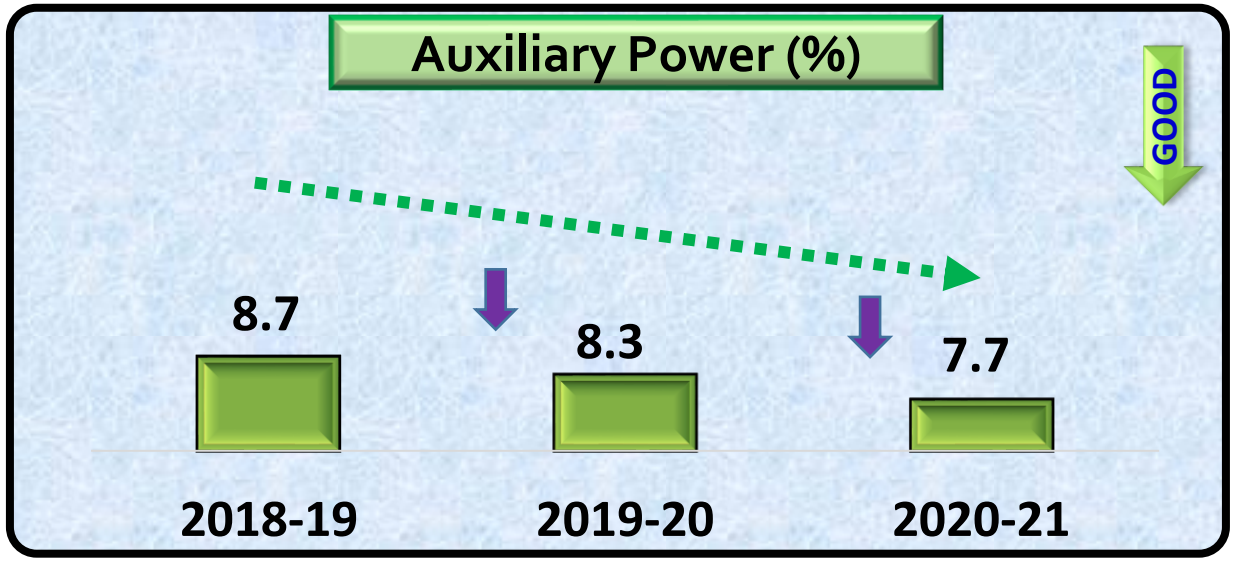
Process Flow Diagram

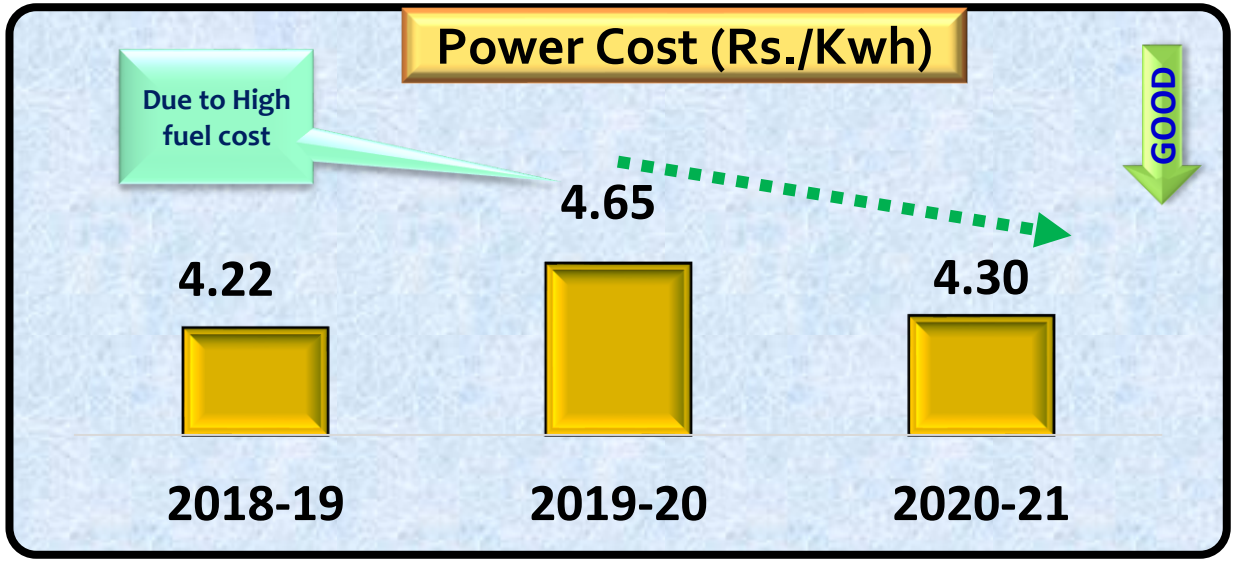


Key Performance Indicators - TPP

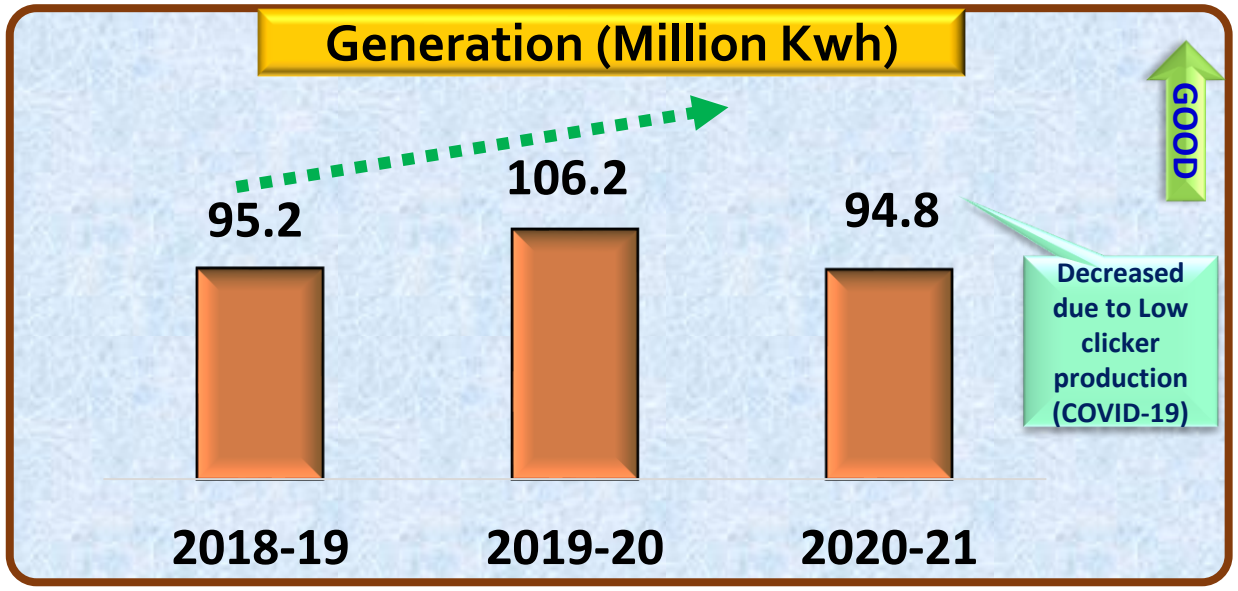


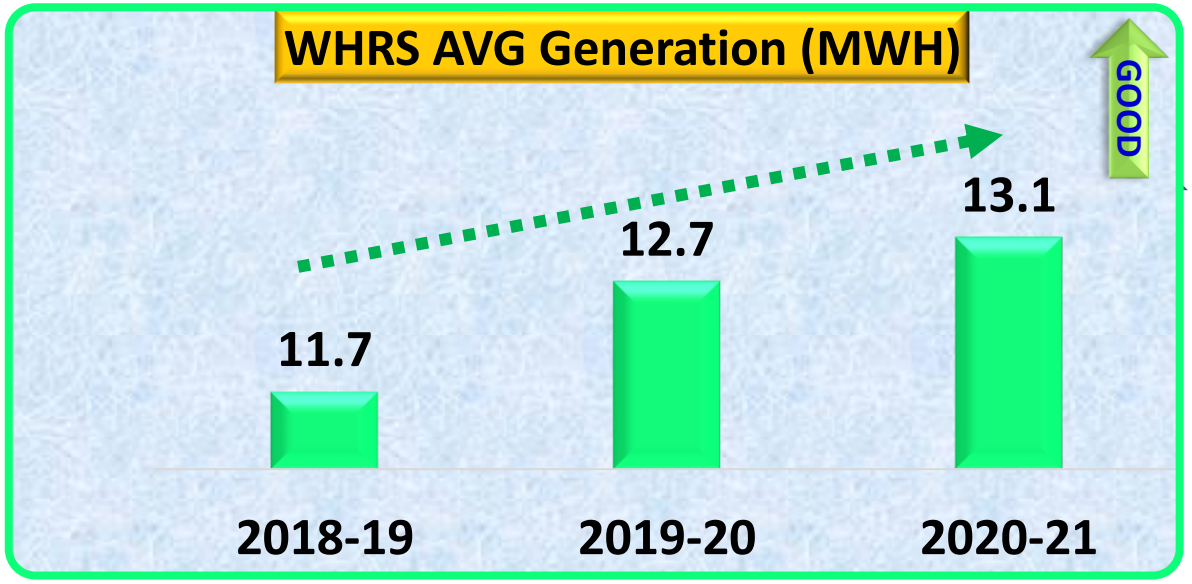


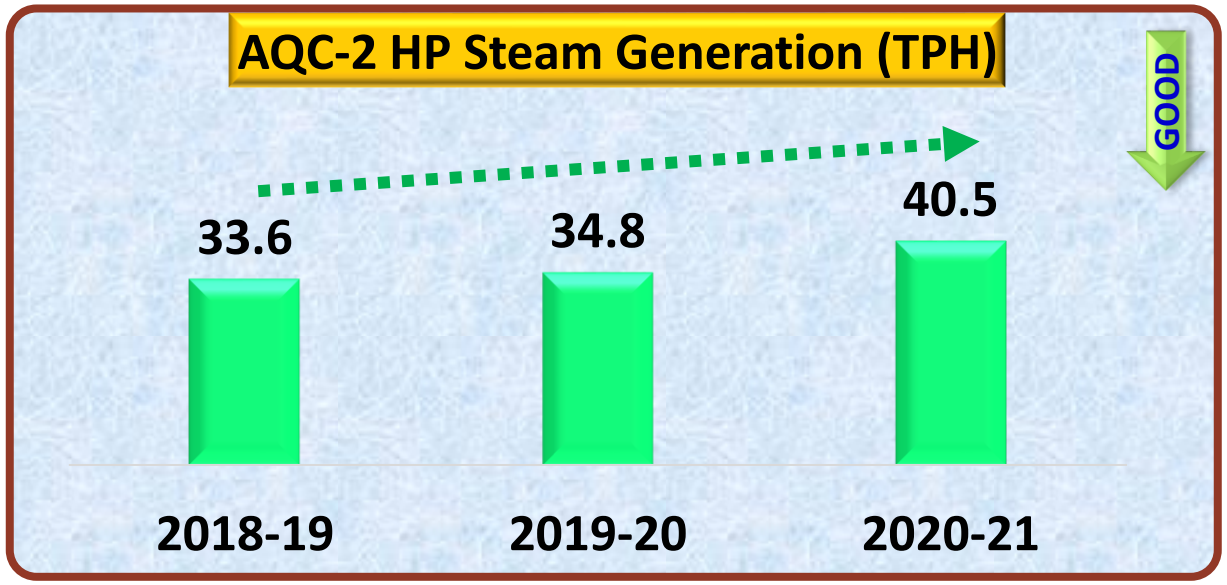


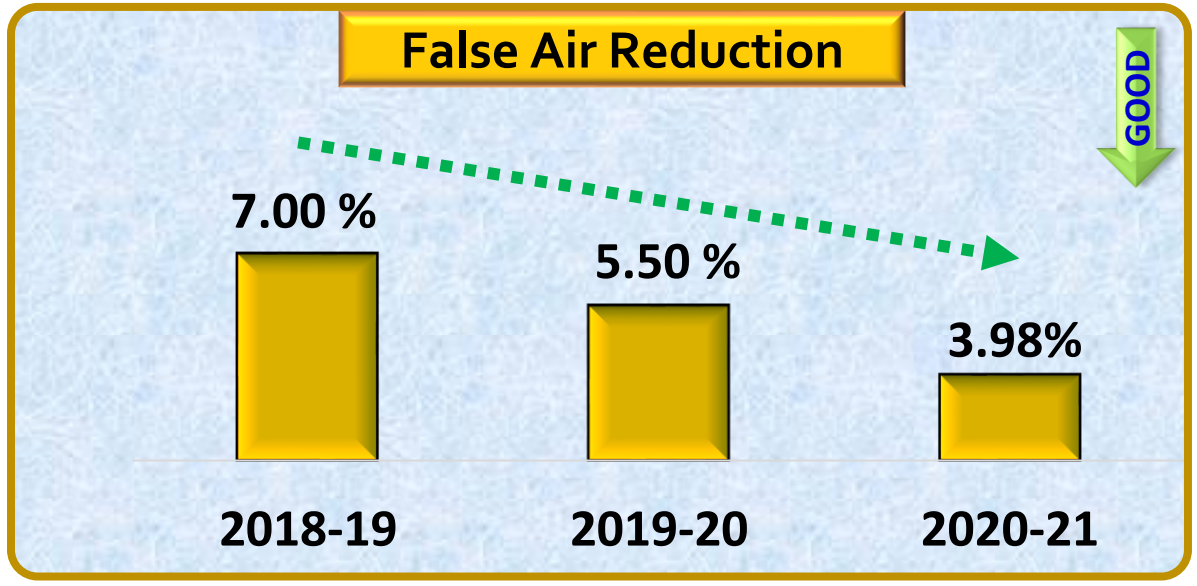


Key Performance Indicators - WHRS

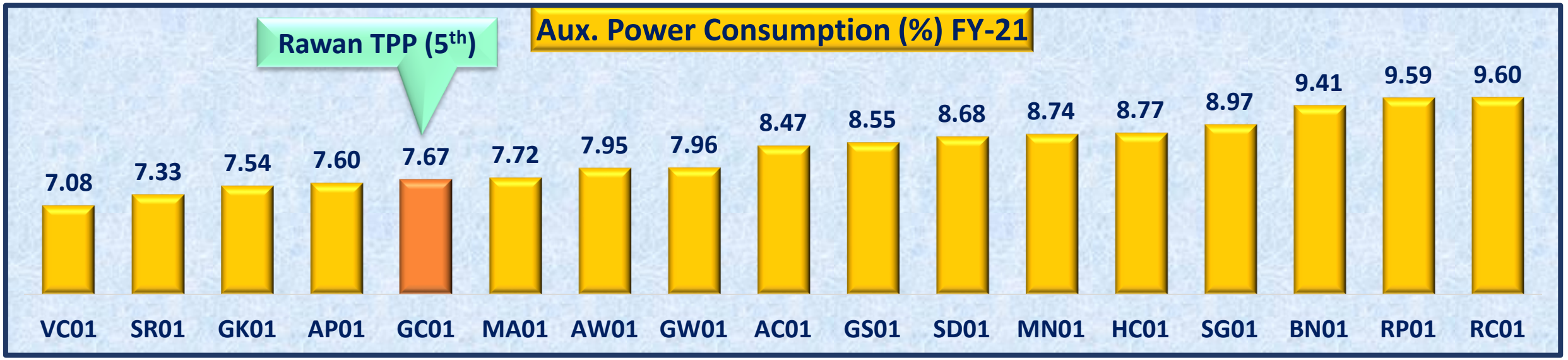


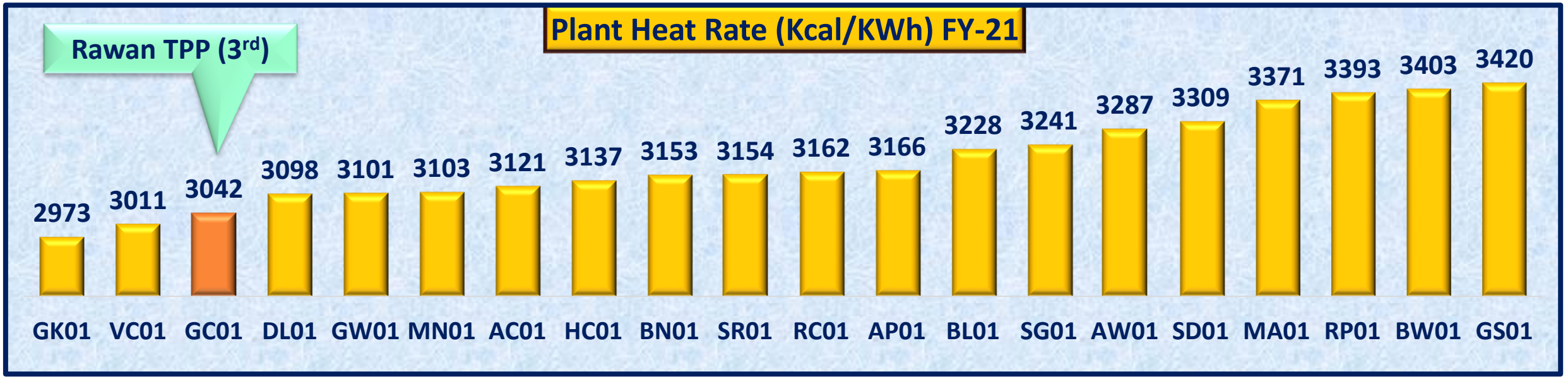






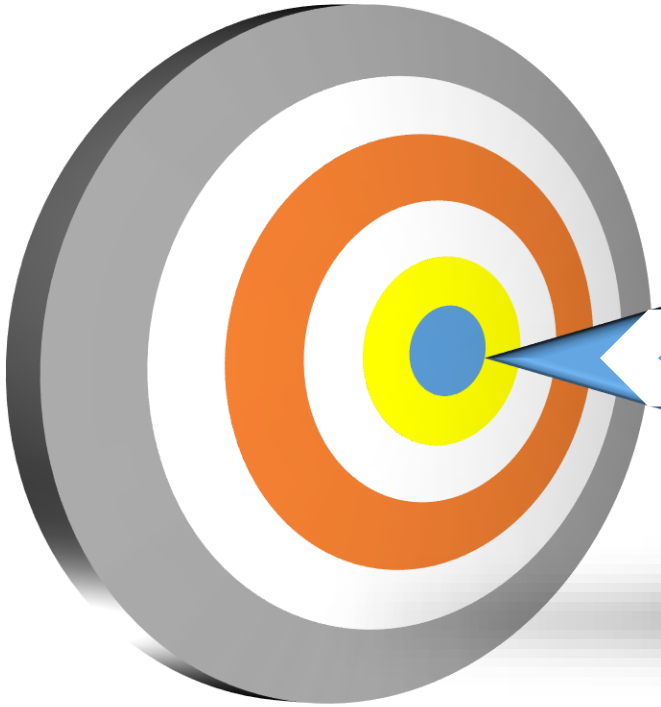
Plant Performance Benchmarking With UTCL Units





Team Focus Area and Target

" FOCUS AREA = FUEL COST +FIXED COST+ ENERGY CONSERVATION + DIGITALISATION "



Safety

Reduction in Fix Cost

1. Man Power Optimization.
2. PR/PO Cost reduct.

Reduction in Energy Consumption.

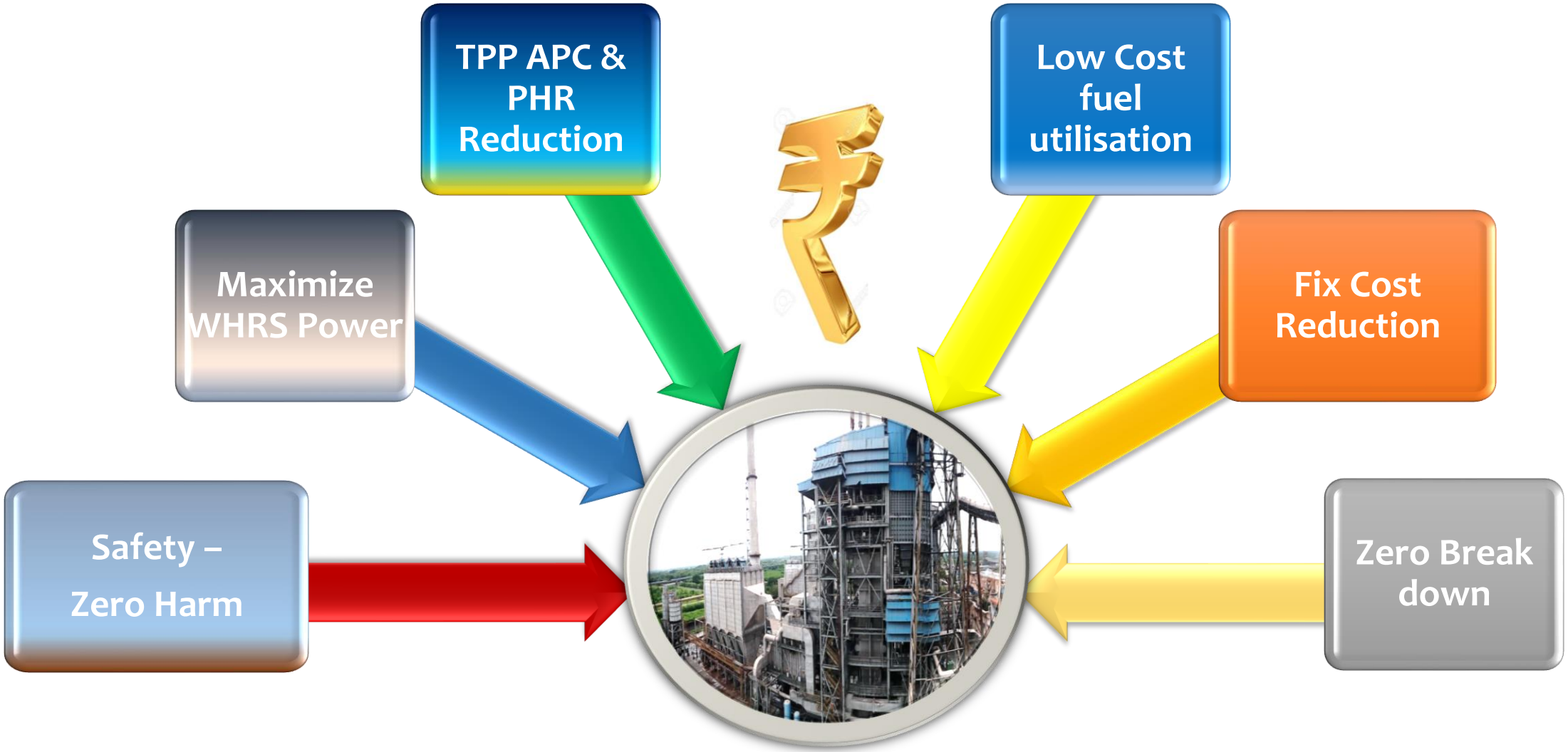
1. Reduction in TPP Heat Rate.
2. Reduction in Auxiliary Power Consumption.
3. Plant Reliability by monitoring R1/S1& R2/S2 and Condition Based Monitoring.

Reduction in Power Mix Cost

1. WHRS Generation enhancement by 4.0 MW.
2. HAR System in Line-2
3. Reduction in TPP Fuel Cost by using Low-Cost Fuel & AFR.
4. TG # 2 Major Overhauling .
5. Optimization – Optimax Operation

TARGET	Power Mix Cost	Fuel Cost	Aux. Cons.
	Rs. 3.18 Rs/KWH	Rs. 4.07 Rs/KWH	7.18 %

Platforms for Improvement Opportunity



Saving 1425.32 Lac/Annum

Engage to Excel – Team of Teams

Priority	Qty.	Saving (Rs-Lacs)
P1	43	504
P2	42	921.32
P3	3	0
Total		1425.32

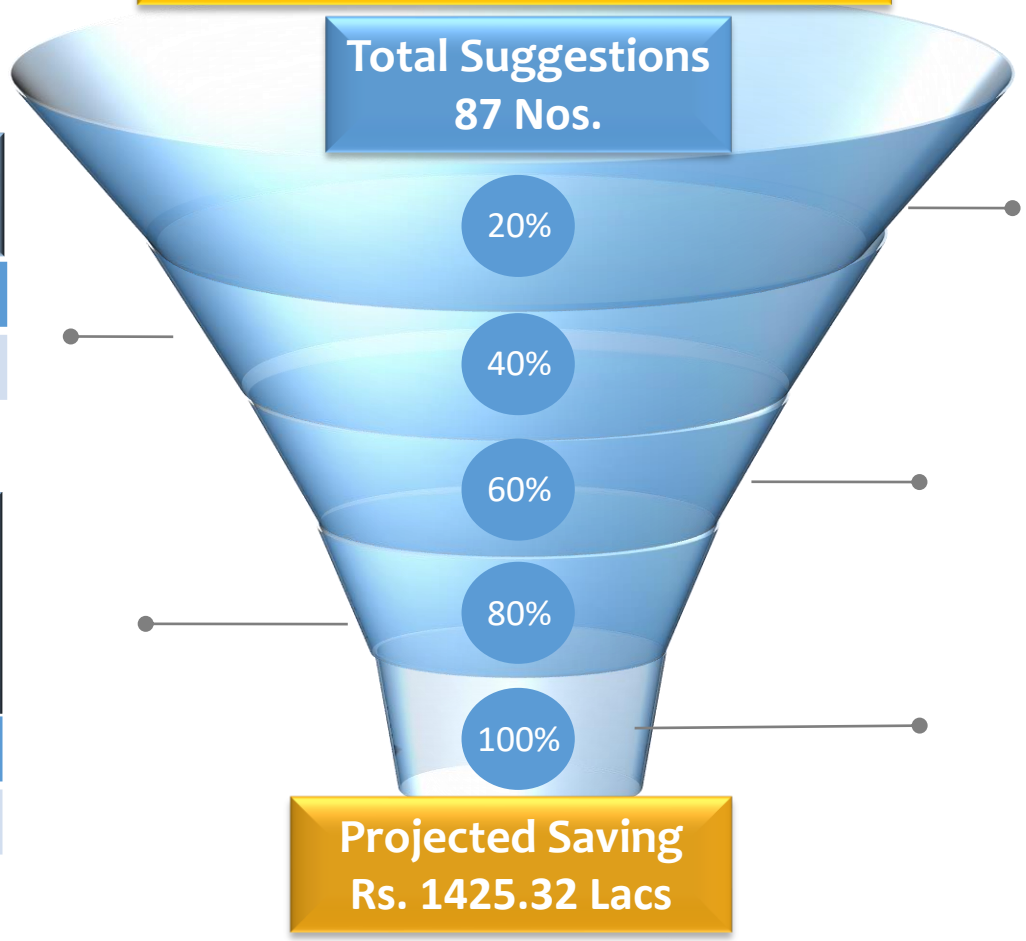
P1 : Easy to Implement, No cost Involved, high business impact.

P2 : Slight Modification , Legal Permission and cost involved.

P3 : Moderate business Impact.

Team Work, Emp. Involvement & Monitoring

Funneling of Suggestions



Store & Spares and Repair & Maintenance

Qty	Saving
14	107.65

Easy to Implement with slight modification by use of internal resources in less cost with high Business Impact (Priority- P2)

Qty	Saving
41	921.32 Rs. Lac

Difficult to implement with less Business Impact and High Cost Involved

Qty	Saving Rs.
10	9 Rs. Lac

Some how difficult, required shutdown, Cost and high business Impact (Priority-P3)

Qty	Saving Rs.
03	0 Rs. Lac

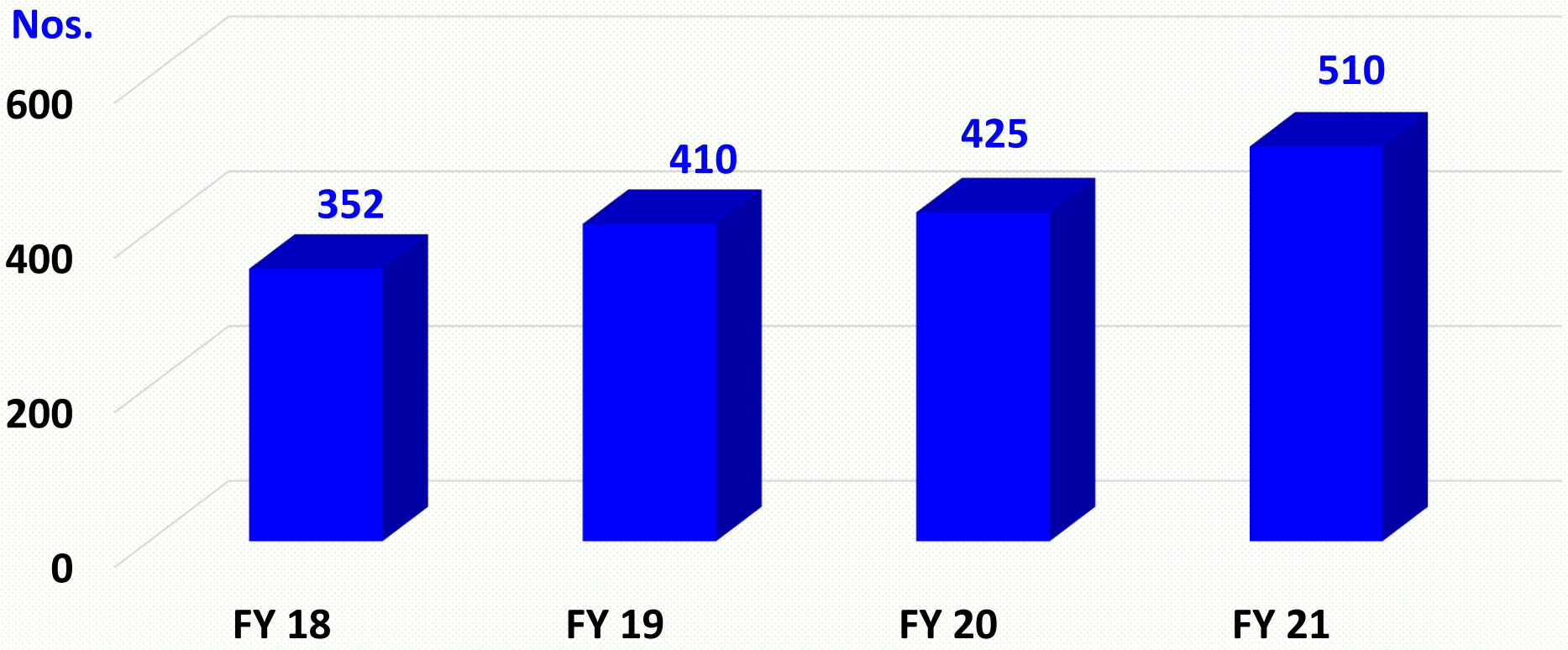
Easy to Implement, No cost Involved with high Business impact & reliability improved (Priority-P1)

Qty	Saving Rs.
43	504 Rs. Lac

Priority /Cost	Area Of Suggestion				Total	Cost Involvement Qty	No Cost	Target Date	Cost benefit
	KPI Improvement	Safety	WCM	Relaibility					
P1	22	6	11	4	43	26	17	31.03.2022	504.0 Rs. Lac
P2	21	2	9	9	41	20	21	30.03.2022	921.32 Rs. Lac
P3	3	1	1	1	3	1	2	31.10.2021	0 Rs. Lac

Team Work & Employee Involvement

Kaizens/Suggestions Implemented



Major Initiative for People and Team Development

1. *Identified of 2 Best Six sigma Project from suggestion list and cross functional team formation done for execution of project.*
2. *People skill development through on the job training , learning from other units and presentation on technical topics.*
3. *Promote TPP Paathshala & Margdarshan program to increase the technical knowledge of employee.*
4. *Focus of multiskilling to reduce the BSR cost and effective utilization of manpower.*
5. *Conducting in- house classroom training program to improve the knowledge of employee on safety, behavioral and functional skills.*

Details of Energy Saving Projects

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SN	Financial Year	Investment/ No Investment	No. of Projects	Electrical Energy (MWH)	Heat Energy Savings (TOE/Year)	Savings in Rs. Million	Invested Amount in Rs. Million
1	2020-21	No Investment	15	2236	798	17.25	5.9
		Investment	4	1280	521	7.02	
2	2019-20	No Investment	13	1820	756	3.63	12.2
		Investment	9	1280	480	13.8	
3	2018-19	No Investment	17	1528	760	17.25	6.5
		Investment	5	761	450	7.02	
Total			59	8905	3765	65.9	24.6

TOTAL SAVED ENERGY- 4649 TOE

Major Energy Conservation Projects 2020-21

Sr. No.	Energy Saving Tasks	Annual Energy Savings		Savings (Rs million /Annum)
		Electrical (kWh)	Thermal Energy TOE/Year	
1.	Reduction in Plant Heat Rate by 20 Kcal/kwh through Fine tuning of Auto process controller in TPP-2. (Optimization of Dump loss)	NIL	333	3.1
2.	Reduction in Auxiliary power consumption in Boiler Fans by 580 Kwh/day through Fine tuning of Auto process controller in TPP-2. (Optimization of oxygen in furnace.)	191400	NIL	0.62
3.	Reduction in Plant Heat Rate by 12 Kcal/Kwh by Hydrojet cleaning in TPP-1 ACC.	NIL	166	1.5
4.	Reduction of TPP fuel cost by 0.02 Rs/Kwh by Use of Alternate Fuel in Boiler. (10% by mass).	NIL	NIL	6.5
5.	Reduction of TPP Plant heat rate by 60 Kcal/Kwh by the usage of surplus WHRS steam to TPP.	NIL	1098	10.2
6.	Reduction in Aux. power consumption by 1500 Kwh/Day in TPP-1 ACC Fans by high pressure Hydrojet cleaning of chocked fin tubes.	495000	NIL	1.61
7.	Reduction in Aux. power consumption by 800 Kwh/Day in TPP-2 ACC Fans by high pressure Hydrojet cleaning of chocked fin tubes.	264000	NIL	0.86
8.	Reduction in TPP-2 Boiler Feed Pump Auxiliary Power Consumption by replacement of attemperator nozzle to reduce DP of 1.5 Kg/cm2.	179520	NIL	0.583

Major Energy Conservation Projects 2020-21

Sr. No.	Energy Saving Tasks	Annual Energy Savings		Savings (Rs. million /Annum)
		Electrical (kWh)	Thermal Energy TOE/Year	
10.	Reduction in TPP-2 Boiler Feed Pump Auxiliary Power Consumption by 480 Kwh/Day through major Overhauling of pump by KSB.	138600	NIL	0.450
11.	Reduction in WHRS ACC Fan power by replacement of existing blade with new energy efficient blades.	158400	NIL	0.515
12.	Reduction in Compressor Auxiliary Power Consumption by reducing Compressor SPC reduced from 4.37 to 3.20 through operational philosophy and Loss correction.	169620	NIL	0.551
13.	Reduction in TPP Boiler Fans Auxiliary Power Consumption by reducing SPC from 19.72 to 17.6 through removal of suction dampers and False air reduction.	246840	NIL	0.802
14.	Optimization of CHP power consumption.	99000	NIL	0.322
15.	Connected HPH-1 drain line with LPH to reduce Plant Heat Rate by 6 KCal/Kwh.	0	100	0.9
16.	Optimized the windbox pressure from 950 to 850 mmWC @PLF <65%.	99000	NIL	0.322
	Total	2041380	1696	28.82

TOTAL SAVED ENERGY- 1872 TOE

Major Energy Conservation Projects 2019-20

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Sr. No.	Energy Saving Tasks	Annual Energy Savings		Savings (Rs million /Annum)
		Electrical (kWh)	Thermal Energy (TOE/Year)	
1	Reduction of TPP Plant heat rate by the usage of surplus WHRS steam to TPP.	122500	1098	11.38
2	Reduction in specific power consumption of K-Pump from 4.0 to 3.0 Kwh/MT by proper air balancing to the system.	70000	NIL	0.32
3	Reduction in BFP Power consumption by further DP Logic modif. as Per load.	87500	NIL	0.39
4	Reduction of false air from 5.5 % to 3.3%.	73500	NIL	0.33
5	Reduction of Specific power consumption of Boiler Fans Power from 21.47 to 19.95 Kwh/Mw by taking the corrective action on Air slide system of MDC System (i.e. ash recirculation system of Boiler).	295556	NIL	1.33
6	Optimization of lighting power consumption.	11771	NIL	0.05
7	Reduction of compressor Power by optimizing the air consumption in ash handling system by implementation of in-house logic for ash handling system as per load.	46278	NIL	0.21
8	Reduction in specific power consumption of AC from 3.63 to 2.67 Kwh/MW by installing the AC controller (6Nos.)	186200	NIL	0.84
9	Line-2 ESP Power consumption reduction from 500 Kwh to 300 Kwh/Day	70000	132	0.32
10	Reduction in TPP Fly ash LOI from 2.35 to 2.10 % by implementation of MDC RAV Logic with Bed temperature.	NIL	389	1.31
11	Wind box pressure reduced to 1040 from 1250 in Boiler-2.	196000	NIL	4.74
	Total	4186199	1619	21.2

TOTAL SAVED ENERGY- 1719 TOE

Major Energy Conservation Projects 2018-19

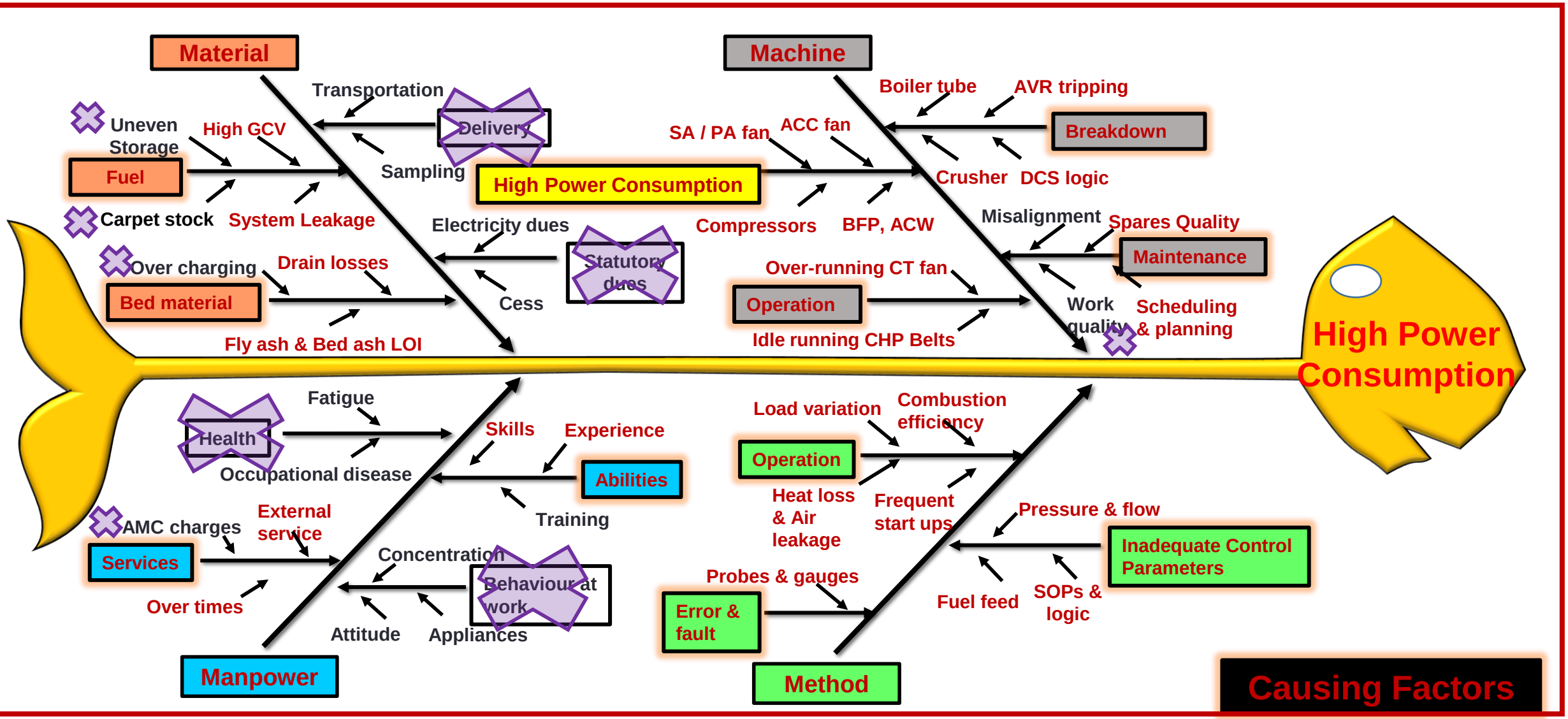
ADITYA BIRLA

Sr. No.	Energy Saving Tasks	Annual Energy Savings		Savings (Rs million /Annum)
		Electrical (kWh)	Thermal Energy (TOE/Year)	
1	Auto Operation of Dump steam in Line-2	Nil	259	2.22
2	DM water Consumption reduced from 40 to 16 M3 in Line-2	Nil	481	4.12
3	TPP Fly ash LOI reduction from 3 to 2%	Nil	880	7.54
4	Line-2 ESP Power consumption reduction from 2000 Kwh to 950 Kwh/Day	339465	NIL	1.43
5	AC Power Reduction.	285797	NIL	1.21
6	Compressor Power Consumption Reduction in Line-2.	161650	NIL	0.68
7	K -pump Power consumption reduction.	276748	NIL	1.17
8	Line-1 ESP Power consumption reduction from 1940 Kwh/Day to 550 Kwh/Day.	172916	NIL	0.73
9	Line-2 ESP Power consumption reduction from 930 Kwh/Day to 500 Kwh/Day.	139019	NIL	0.59
10	Optimization of lighting power Cons.	47450	NIL	0.20
11	PA air temp increase 7 Deg C by replacing APH tube in PA path in line-2 (150 Nos.).	Nil	92	0.78
12	BFP Auto DP logic implemented as per looking Load MW in Line2.	484950	NIL	2.05
	Total	1907995	1612	22.72

TOTAL SAVED ENERGY- 1712 TOE

Innovative Projects & Implementation – Aux. Power

Analysis: Key Factors Causing High Power Consumption



Innovative Projects & Implementation

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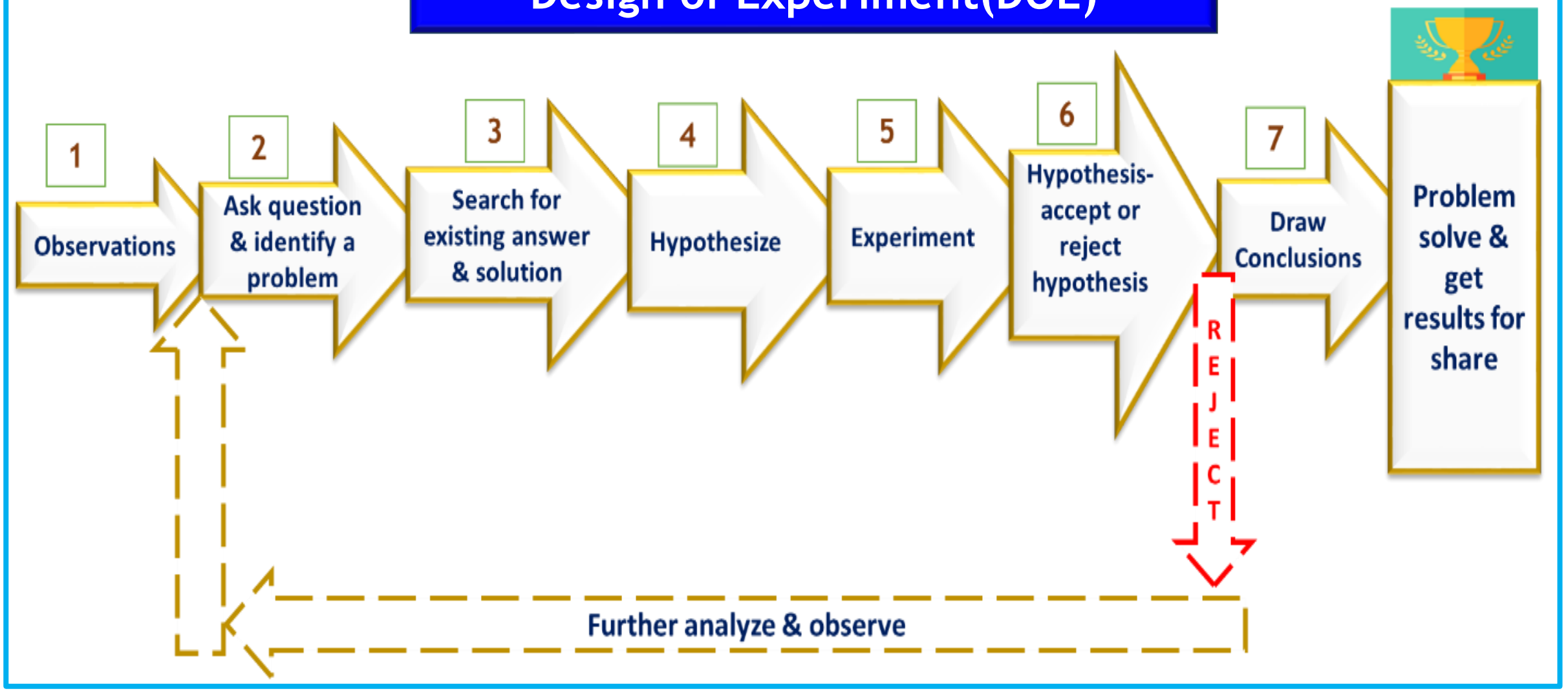
Design of Experiment(DOE)



Initiative-1 : Reduction in TPP-2 Auxiliary Power Cons. By APC

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THEME

Reduction in TPP-2 Auxiliary Power Consumption by digitization of Boiler-2 through Advanced Process Controller (APC).

PROBLEM

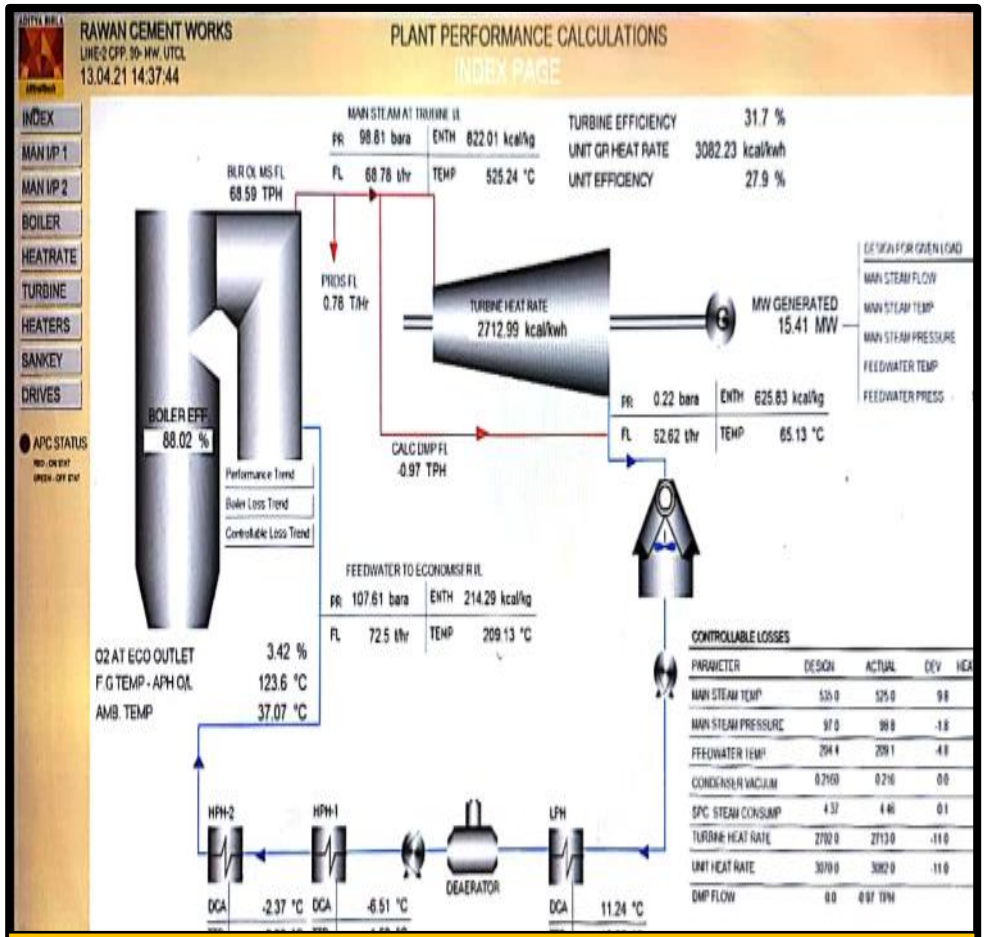
- High Load variation during solar hour.
- Process Optimization through manual intervention.

SOLUTION

- Installation of Advanced Process Controller in TPP-2 Boiler.
- PID Logic modifications to smoothen process operation.
- Fine tuning of logics for process optimization.

BENEFIT

- Automation of Boiler Operation with less manual intervention.
- Fine tuning of Advance process controller resulted in power saving of 570 Kwh/Day in boiler Fans.
- Achieved Annual Monetary Gain of 5.64 Lacs.



Advanced Process Controller in TPP-2

Gain of Rs. 5.64 Lacs / Annum

Initiative-2 : Reduction in Boiler Fans Auxiliary Power Cons.

ADITYA BIRLA
UltraTech

THEME

Reduction in TPP-2 Boiler Fans Auxiliary Power Consumption.

PROBLEM

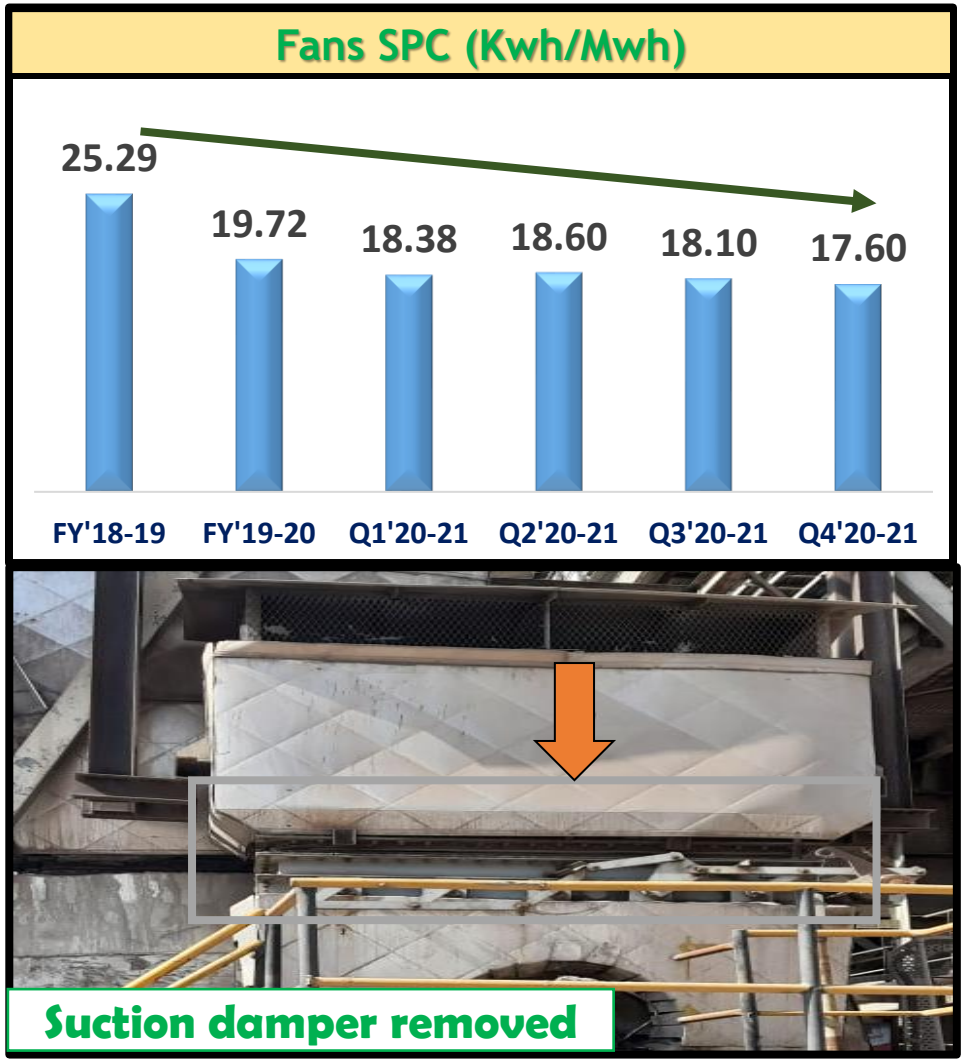
- False air ingress across boiler circuit was high @5.9%.
- Suction air DP was high in both SA and PA Fans due to silencer and suction duct length.

SOLUTION

- Removal of suction damper of SA & ID fan.
- False air reduced from 5.9% to 2.9% .
- Reduced bed height to 850 from 900 mmwc during load < 65%.

BENEFIT

- Boiler Fans SPC reduced from 19.72 to 17.6.
- Achieved Annual Monetary Gain of 11.24 Lacs.



Gain of Rs. 11.24 Lacs / Annum

Initiative-3 : Reduction in Compressor Auxiliary Power Cons.

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UltraTech

THEME

Reduction in Compressor Auxiliary Power Consumption.

PROBLEM

- High bend loss in compressed air network.
- Leakages and loop holes in air circuits.

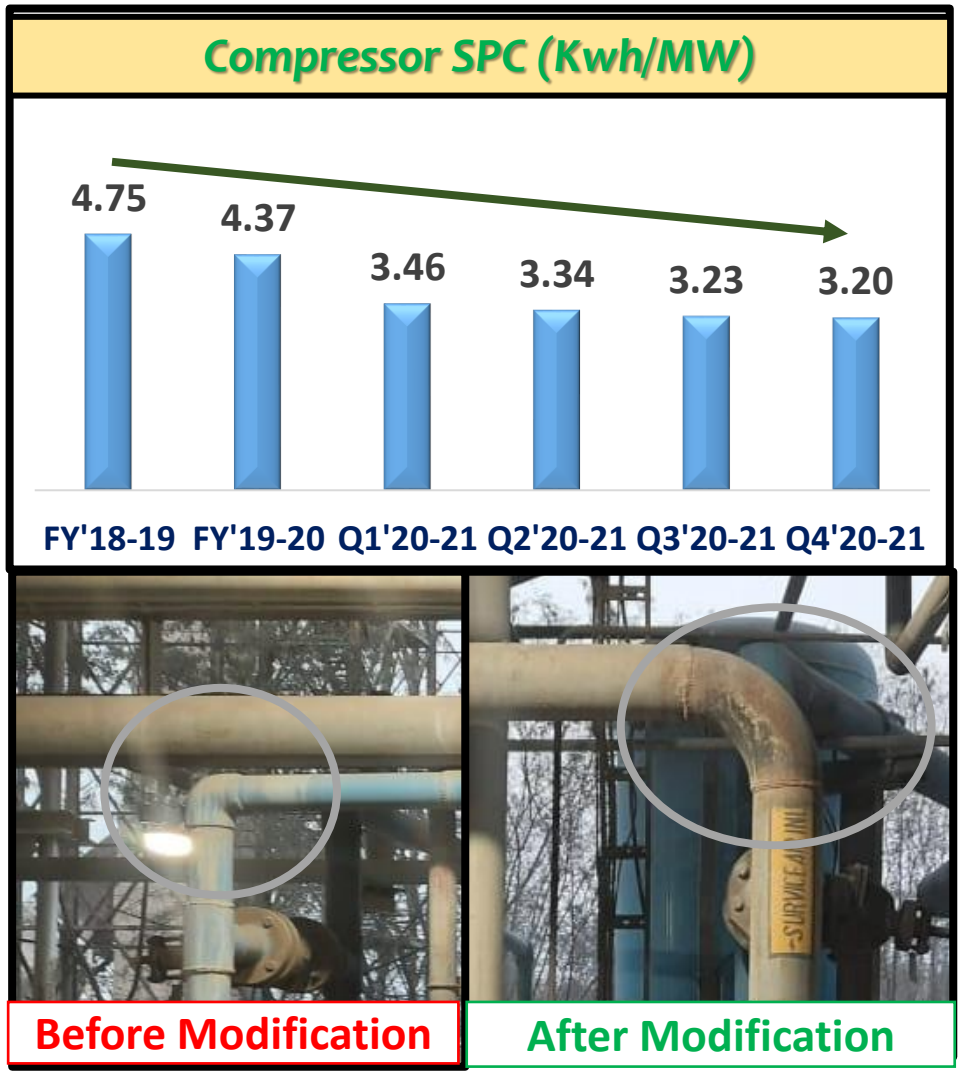
SOLUTION

- Auto logic for fly ash conveying w.r.t load.
- Relocation of 55 KW compressor
- Replaced bends in line with long radius (06 Nos.)
- Revised operation philosophy as.

Only 55 KW comp. at load < 65% V/s. 160 KW.
55 + 75 KW comp. at load > 65% V/s. 160 KW.

BENEFIT

- Compressor SPC reduced from 4.37 to 3.20.
- Achieved Annual Monetary Gain of 5.51 Lacs.



Gain of Rs. 5.51 Lacs / Annum

Initiative-4 : Reduction in TPP-2 BFP Auxiliary Power Cons.

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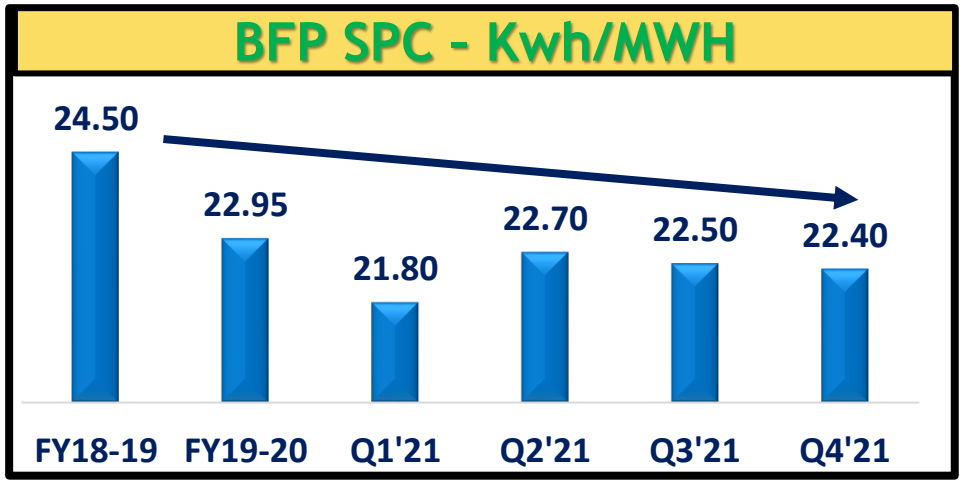
THEME	Reduction in TPP-2 Boiler Feed Pump Auxiliary Power Consumption.
PROBLEM	➢Attemperation efficiency was poor due to old design. ➢High pressure loss across attemperator nozzle.
SOLUTION	➢Replaced the old nozzle with newly designed one. ➢Line pressure parts and gland correction done.
BENEFIT	➢Less DP across the nozzle during water spray. ➢Reduced the BFP DP by nearly 2.0 Kg/CM2. ➢Improvement in reliability of steam temperature to Turbine-2 inlet. ➢Achieved Annual Monetary Gain of 5.83 Lacs.



Gain of Rs. 5.83 Lacs / Annum

Initiative-5 : Reduction in TPP-1 ACC Aux. Power Cons. & PHR

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THEME

TPP-1 ACC Tube bundle fins cleaning through High Pressure water jet.

PROBLEM

Due to surrounding cement dust nearby TPP ACC area, ACC tube fins gets chocked. Because of this, heat transfer effectiveness of ACC decreases and thereby increases Aux. power consumption of ACC Fans and Turbine Heat Rate.

SOLUTION

- In Foam chemical cleaning, hard scaling of tube bundles was not removed. So there was a need to think out of box to remove hard scales. Team brain stormed, thought innovatively to use high pressure (>200Kg/cm2) water jet to remove hard scale.
- For Cleaning of ACC Tube fins, High Pressure hydro-jet system is used. In this, water at a pressure of 250 kg/cm2 is allowed to strike in tube bundles. As a result of this, hard scaling is removed.

BENEFIT

- Achieved Aux. power saving of 1500 KW/Day in ACC Fans considering same TG PLF and ambient temperature.
- Turbine Heat Rate reduced by 10 Kcal/Kwh.

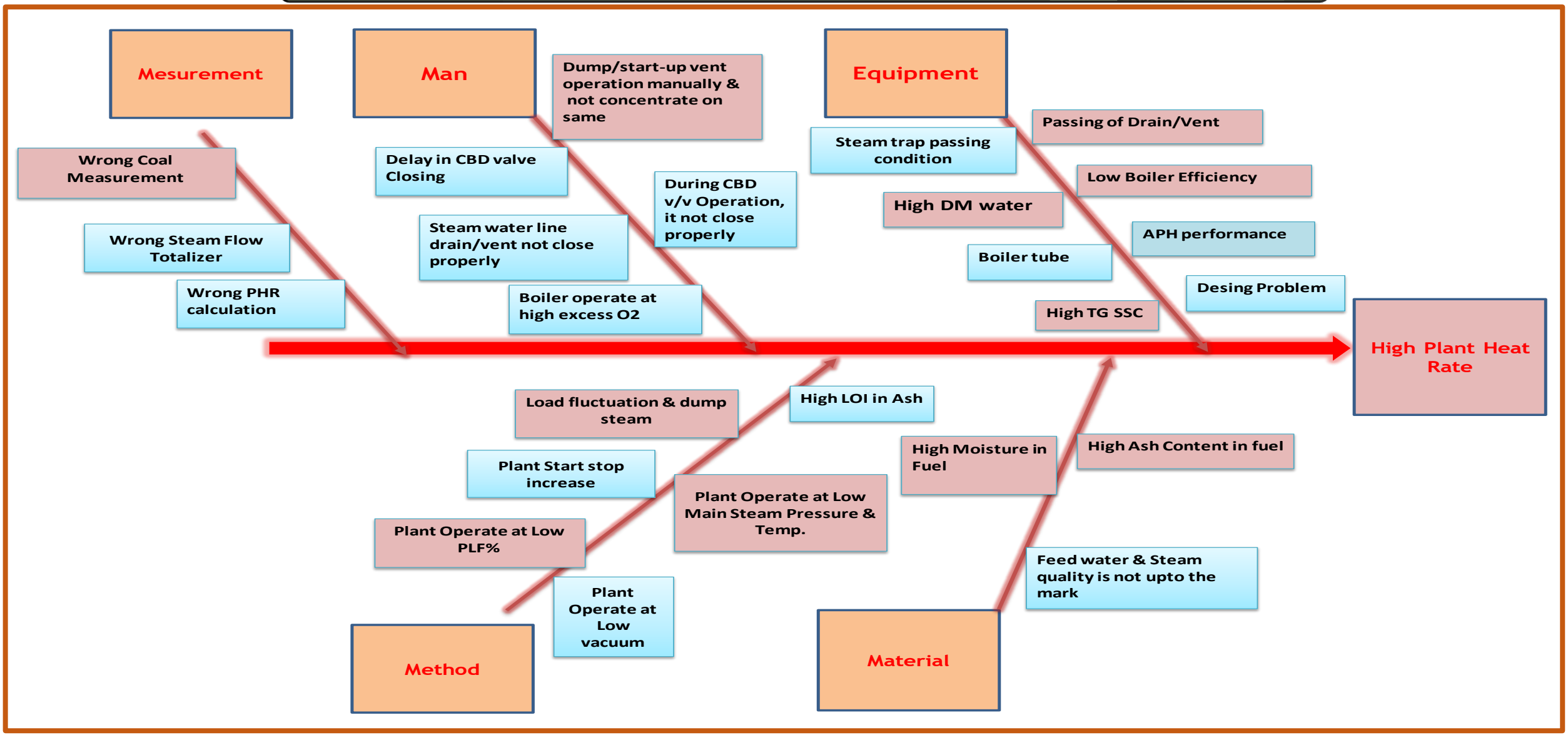
Before Cleaning Bundle Condition

After Cleaning Bundle Condition

Monetary Gain of Rs. 27.32 Lacs / Annum

Innovative Projects & Implementation – Heat Rate

Analysis: Key Factors Causing High Plant Heat Rate



Initiative-1:Utilization of surplus steam of WHRS to reduce TPP PHR

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UltraTech

THEME

Reduction in Heat Rate by Utilization of surplus steam of WHRS at TPP-2.

PROBLEM

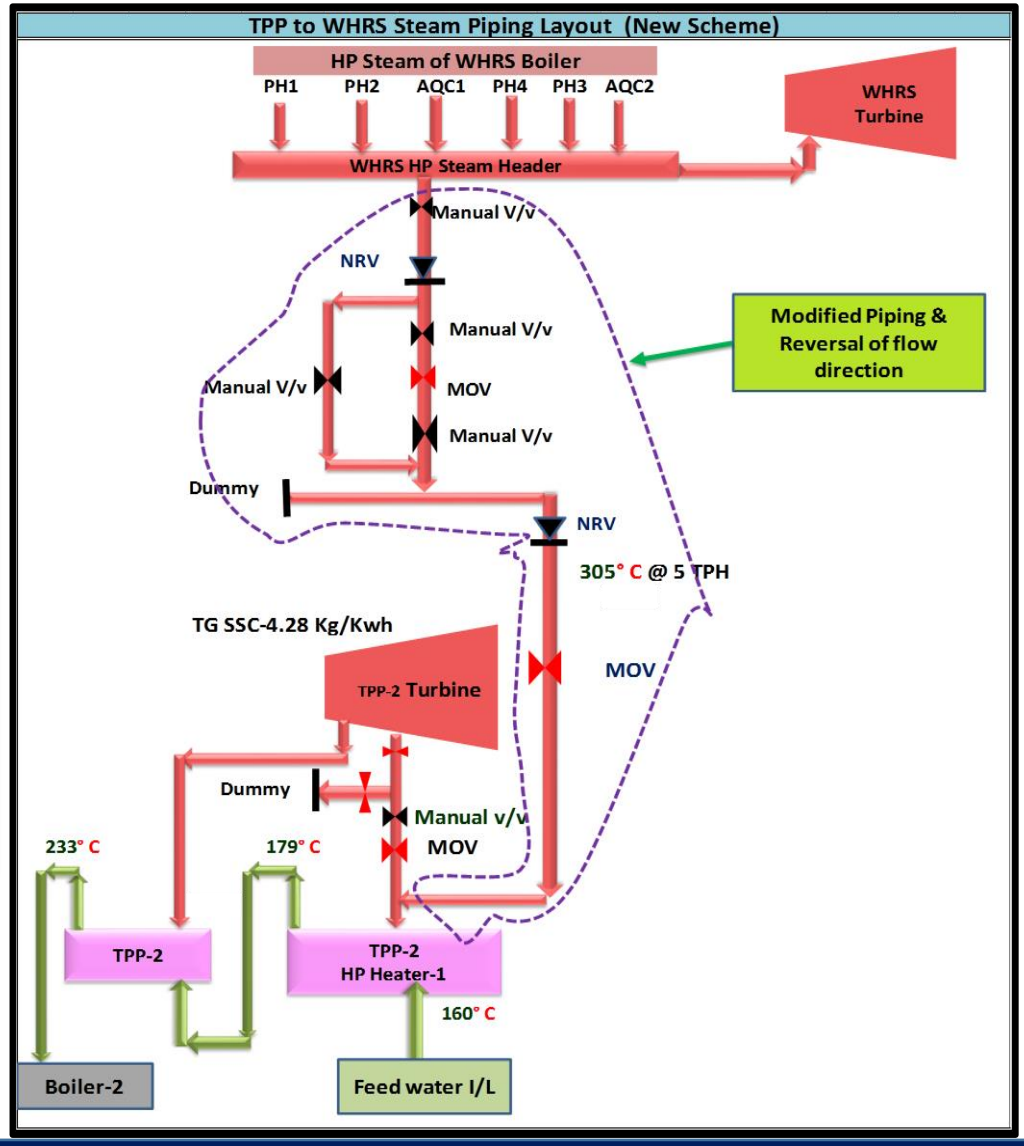
- Earlier HP-1 Extraction steam line circuit which was connected in WHRS in a way to increase WHRS Generation was isolated due loss.
- There was no alternate source to preheat condensate water by utilizing waste heat in TPP-2 HP-1 Heater.

SOLUTION

- Explored the optimum and feasible option to utilize this surplus steam above the requirement of rated capacity running of WHRS which is up to 15.18 MW. Considered its running at max. 16.0 MW load.
- Existing circuit used for utilization of surplus WHRS steam.
- Flow meter and Pressure transmitter correction done.

BENEFIT

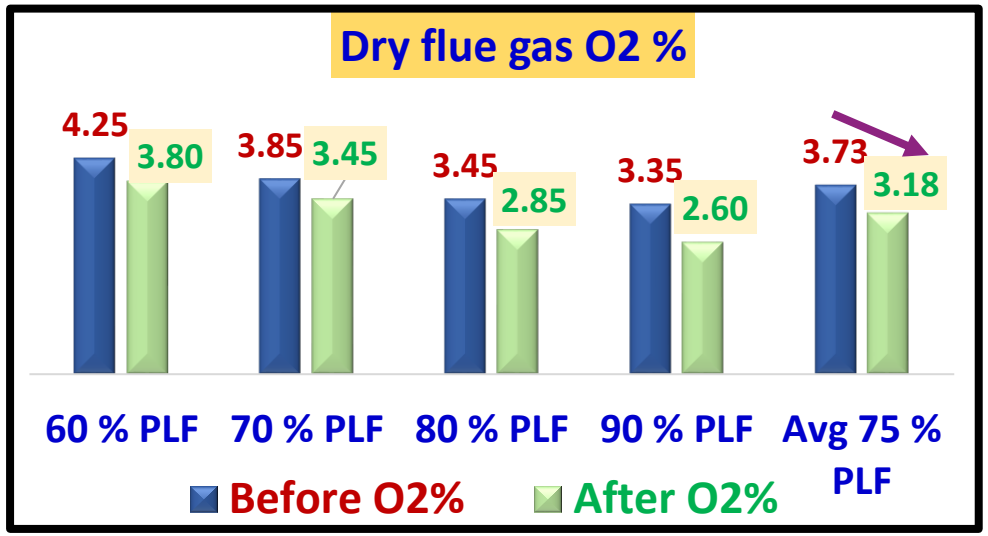
- TPP-2 Plant Heat Rate reduced by 56 Kcal/Kwh.
- ESP Inlet flue gas temperature reduced by 12 Deg C resulting in reduction of PHR of 10 Kcal/Kwh.
- Achieved Annual Monetary Gain of 116 Lacs.

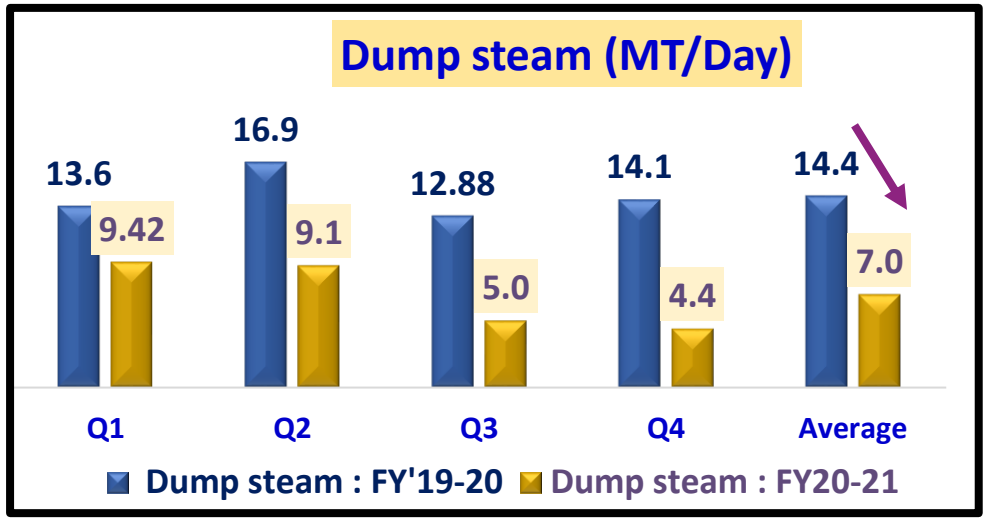


Gain of Rs. 116 Lacs / Annum

Initiative-2 : Heat rate reduction by Fine tuning of APC

THEME	Reduction in Heat Rate by Fine tuning of Auto process controller in TPP-2.
PROBLEM	➢High Load variation during solar hour. ➢Process Optimization through manual intervention.
SOLUTION	➢Installation of Advanced Process Controller in TPP-2 Boiler. ➢PID Logic modifications to smoothen process operation. ➢Fine tuning of logics for process optimization.
BENEFIT	➢O2 reduced by 0.60% approximately & Heat rate by 6.0 Kcal/kwh. ➢Loss reduction of dump steam by 7.4 MT/day & Heat rate by 14.0 Kcal/kwh. ➢Achieved Annual Monetary Gain of 47.0 Lacs.



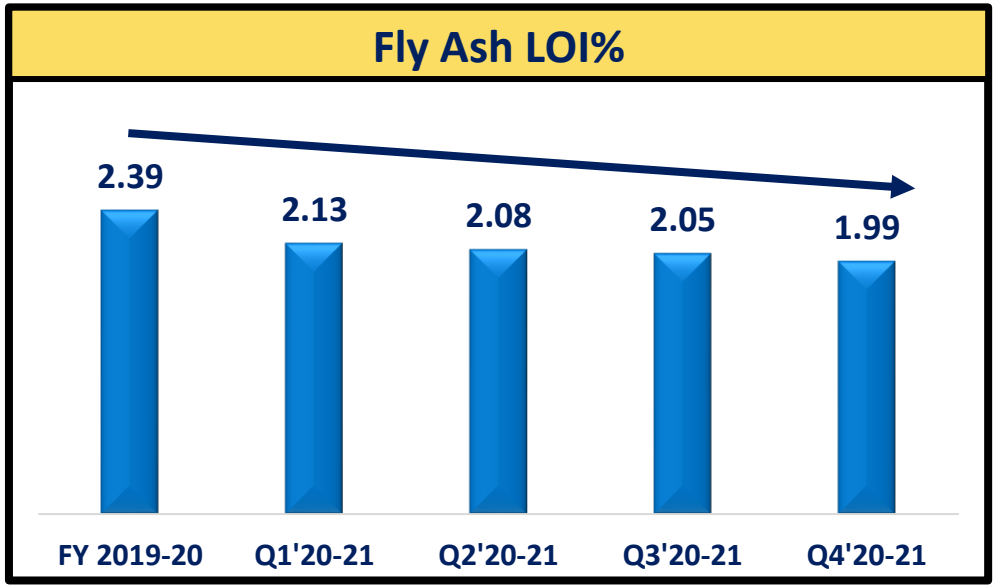


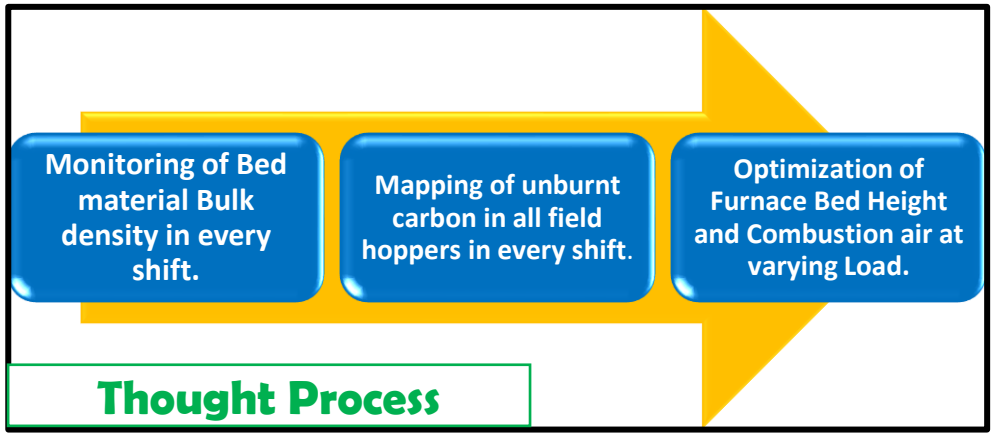
Gain of Rs. 47.0 Lacs / Annum

Initiative-3 : Heat rate reduction by Fly ash LOI % reduction

ADITYA BIRLA
UltraTech

THEME	Reduction in Fly Ash LOI in order to improve Boiler-1&2 Efficiency.
PROBLEM	➢Unburnt Carbon in Fly-ash was 2.4%. ➢False air ingress across boiler circuit was high @6.5%.
SOLUTION	➢Auto MDC operation as per furnace temperature. ➢Fine tuning of bed height as per variable load. ➢Close vigilance on bed material size and keeping shift wise samples to CCR for prompt actions.
BENEFIT	➢LOI reduced form 2.4% to 1.99% resulting in Gross Heat Reduction of 15 Kcal/Kwh. ➢Achieved Annual Monetary Gain of 22.45 Lacs.





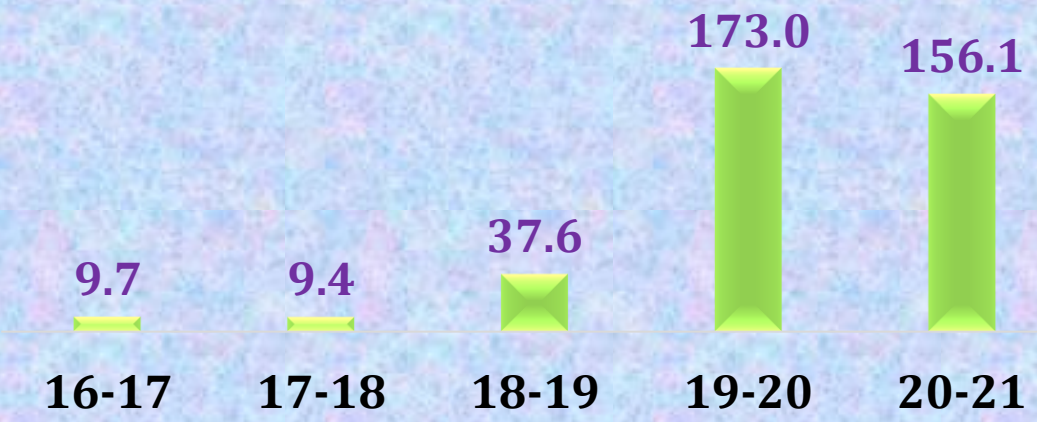
Gain of Rs. 22.45 Lacs / Annum

Renewable Energy Use

Green Township

- 10 MW Solar Power Generation Started from Feb'19
- 800 KWH Solar Panels Installed in FY 2011-12 .
- Colony Power requirement mainly catered through Solar power generation

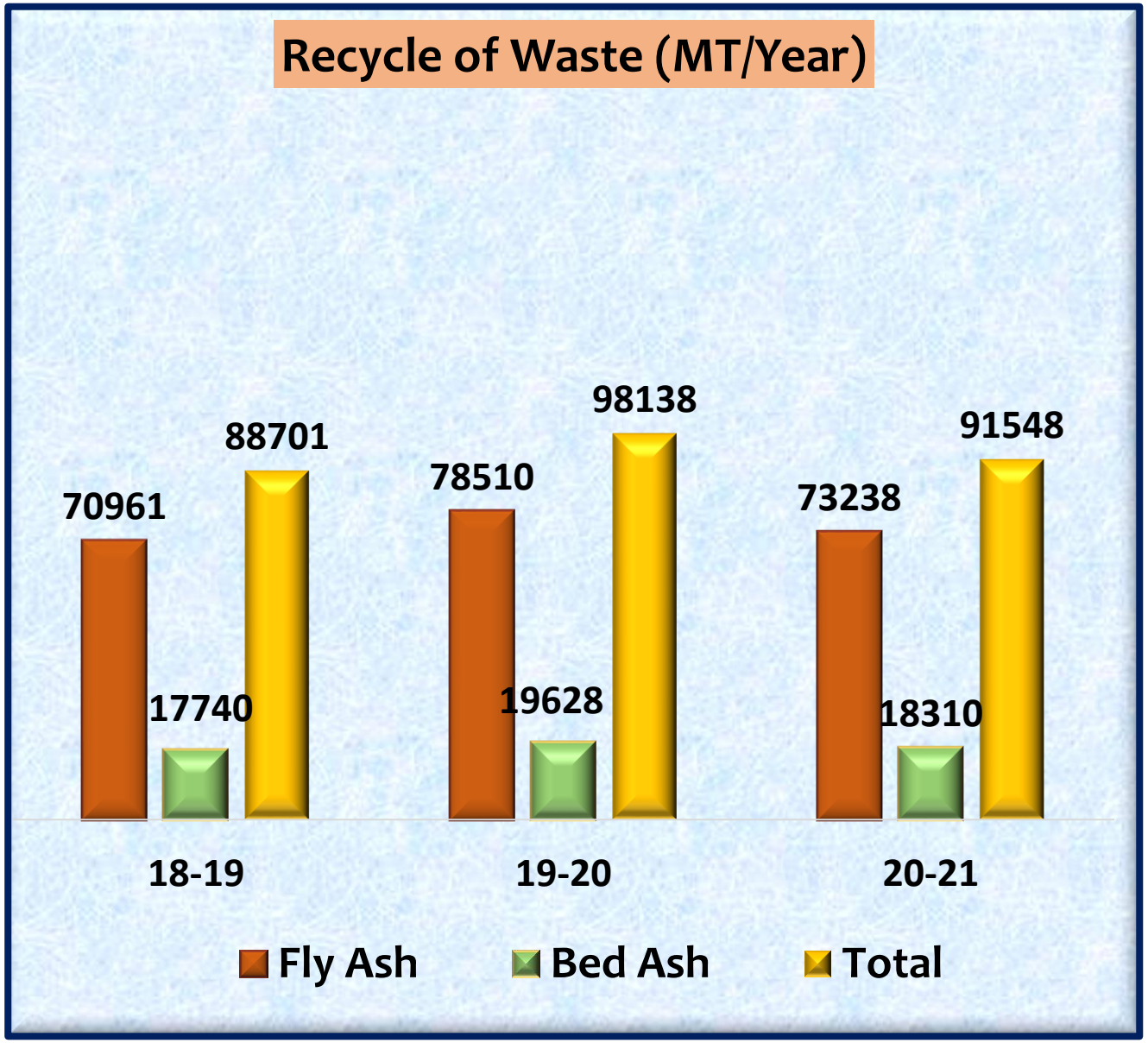
Solar Power Generation



Utilisation / Recycle of Waste

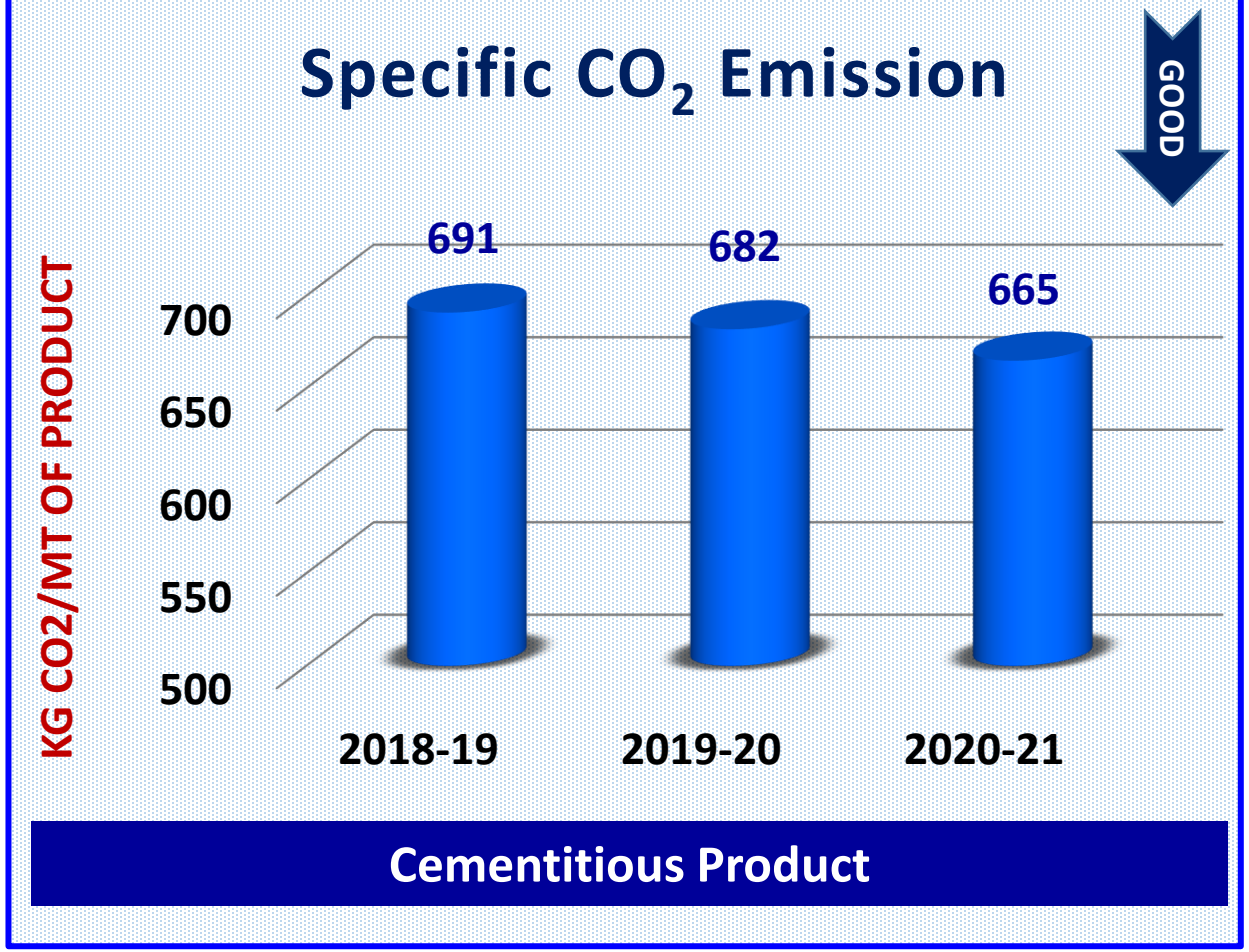
Utilization of TPP fly ash & Bed ash :

- Bed ash as well as fly ash being generated from boilers are conveyed pneumatically to silos.
- From Silos, fly ash is again transported through dense phased closed pneumatic system up to cement mill silos where it is being consumed 100% for cement manufacturing.
- Complete bed ash in storage silos is reconditioned through wet unloading system and then loaded in tipper.
- It is being used completely as a raw material for cement plant. It is added in the raw meal additive hopper for further process at cement plant.



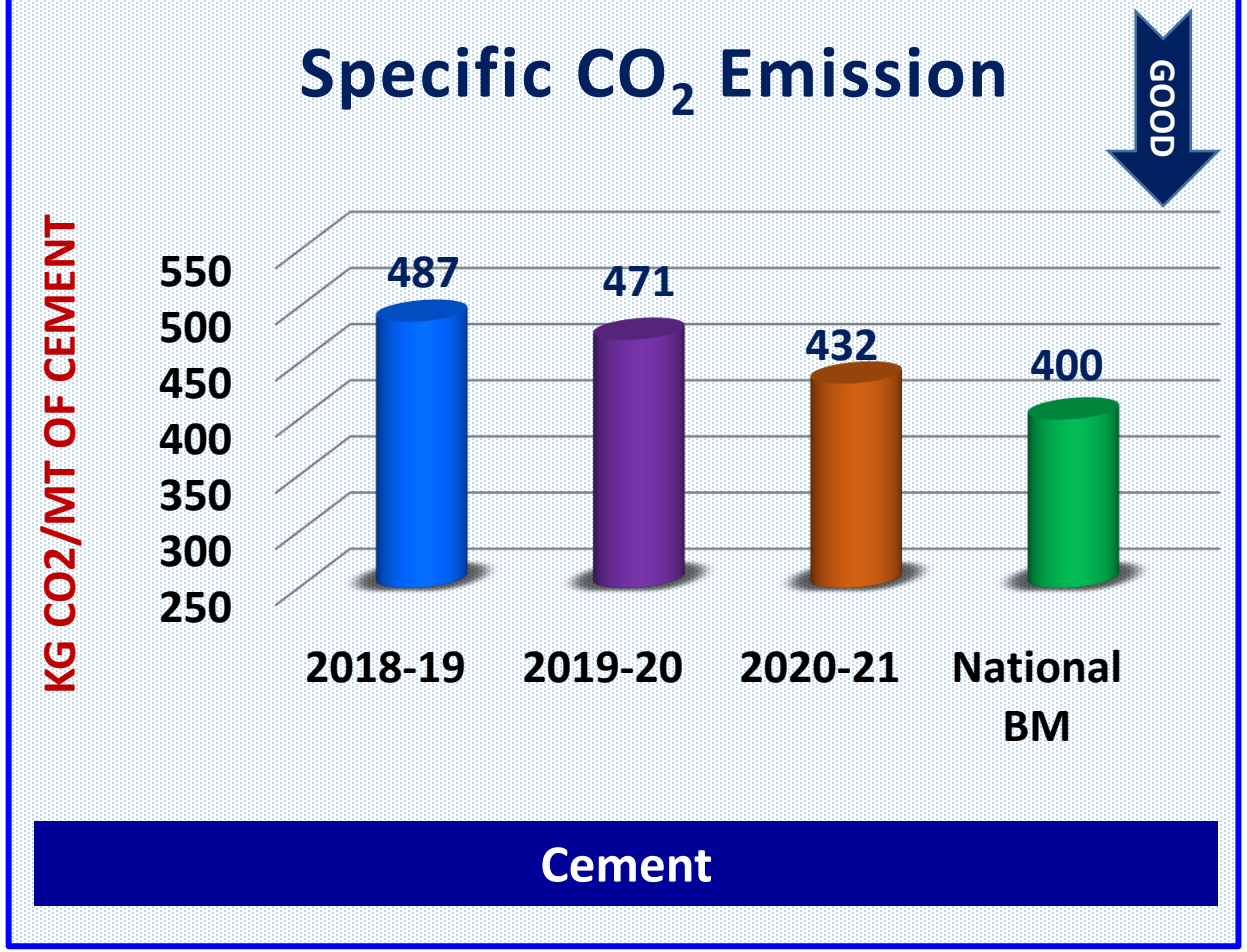
GHG Inventorization

Specific CO_2 Emission



Cementitious Product

Specific CO_2 Emission



Cement

* Lowest Carbon Footprints/Specific Emissions among all UltraTech plants

Environment Management - Water

Best Practices in Water Management :

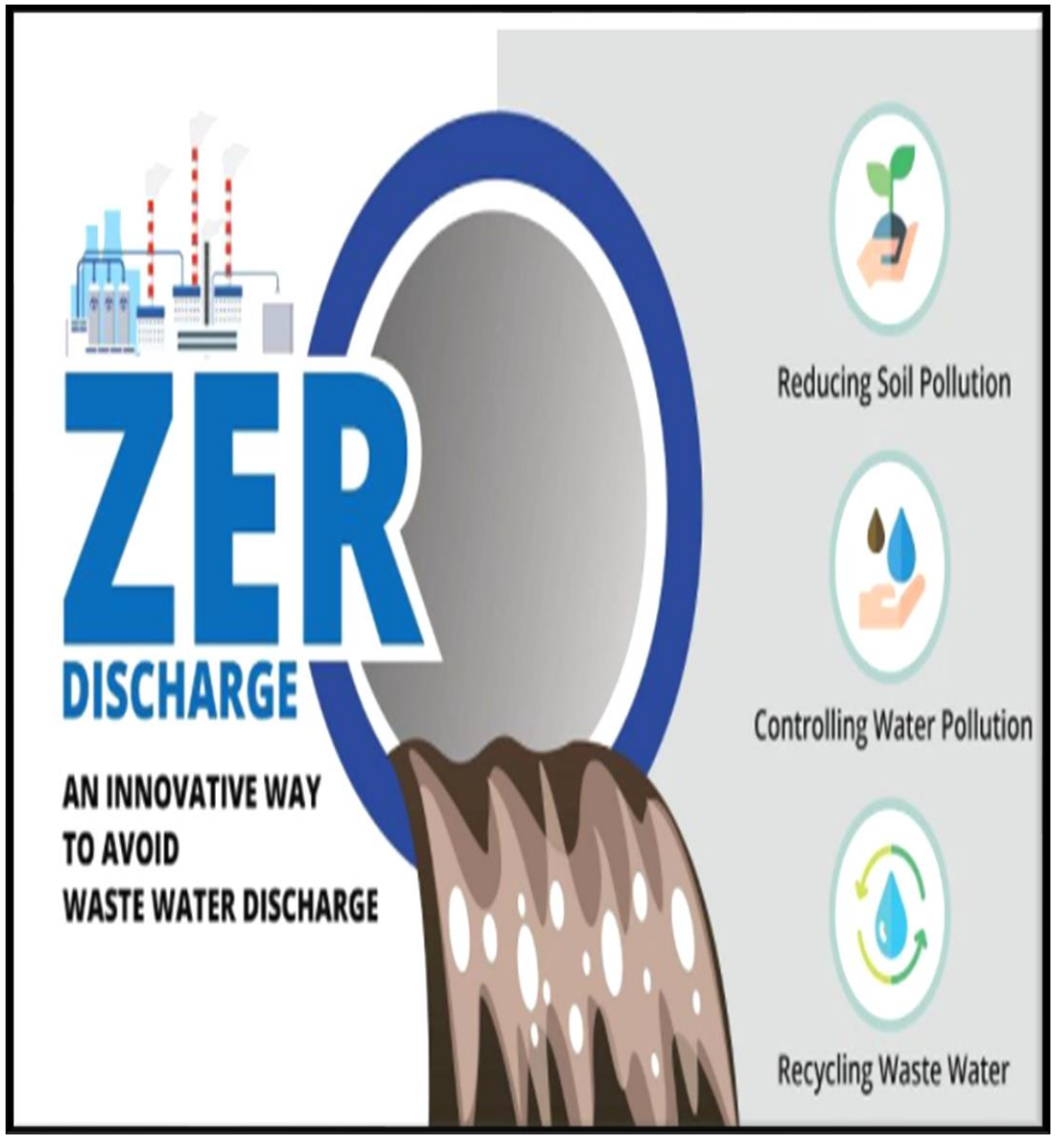
- By Meter/Measure/Manage Method

a. Monitoring & measuring water generation & consumption on daily basis.

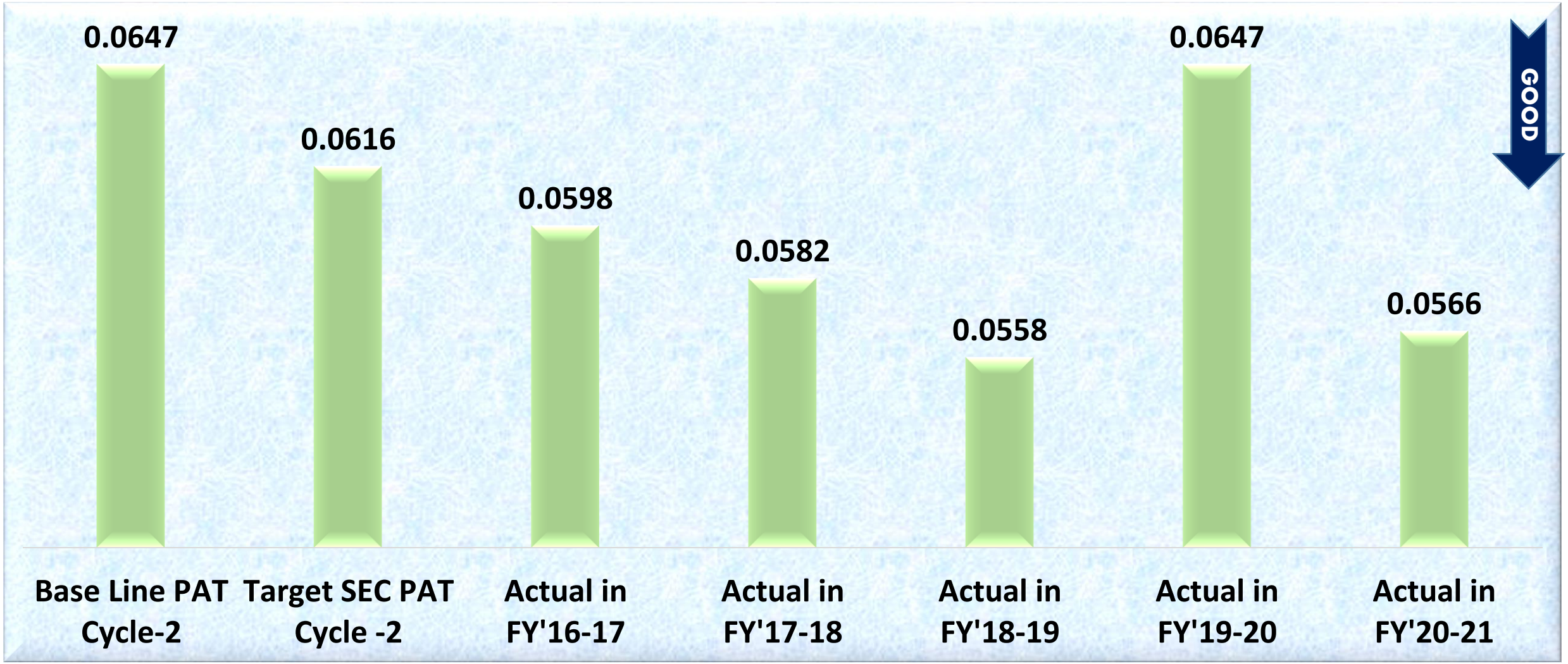
b. Preparing the deviation report for extra water consumption at unit level.

- Utilizing the boiler drain water in cooling towers.
- Stabilizing the STPs at unit colony & factory(plant) & using the STP water in Cooling towers.
- Treating the influent water & using it at plant green garden.
- TPP SWAS drain Water is being used at P&V system.

We are Zero Discharge Plant
Are You……..???????



PAT Status (TOE/Ton of Product)



Save Energy - Save Money - Save the Planet

Green Supply Chain Management

Projects Implemented :

- Reverse logistics - Coal rake used to send Clinker to grinding Units.
- Dedicated 132 KV line between RWCW and HCW. Later, to improver further, the PMS has been hooked up between these two units.

Benefits Achieved :

- Reverse loading of rakes equals to reduction in incoming rakes and resulted in fuel saving.
- Dedicated 132 KV line along with common PMS has helped significantly to improve reliability of operation and plant performance parameters at both end.

Supplier Evaluation :

- Waste Belt Reuse/ Rebuilding
- On the basis of sustainability factors- safety, Health & Environment.
- Joint Improvement projects.

Way Forward: Energy Saving Projects

ADITYA BIRLA
UltraTech

SN	Project in Pipe Line	Gain	Energy Saving Potential	Target Date
1	Reduction of PHR of TPP-2 Turbine by Major overhauling of TG-2.	PHR Reduction	60 Kcal/Kwh	31.10.2021
2	TPP-1 Plant heat rate reduction through condensate water preheating from WHRS AQC-1 boiler outlet flue gas.	PHR Reduction	40 Kcal/Kwh	31.08.2022
3	TPP-1 APH Performance improvement by False air reduction and De-choking & replacement of chocked tube.	PHR Reduction	5 Kcal/Kwh	31.10.2021
4	Reduction of Power in TPP-2 SA Fan in Boiler-2. by replacement of SA fan impeller with new energy efficient (20KWH).	APC Reduction	450 Kwh/Day	31.10.2021
5	WHRS Power enhancement of 4MW by Modification in turbine & boiler.	Power Enhancement	4000 Kwh/Day	31.08.2022
6	WHRS ACC Fan power reduction by replacement of old design ACC Fan (4 nos) with energy efficient blades.	APC Reduction	960 Kwh/Day	30.11.2021
7	Reduction of Aux. power consumption in TPP-1 BFP by modification in internal hydraulic in Pumps.	APC Reduction	420 Kwh/Day	31.03.2022

Way Forward: Energy Saving Projects

SN	Project in Pipe Line	Gain	Energy Saving Potential	Target Date
8	Installation of Water Fog System below ACC Fans to improve vacuum.	PHR Reduction	5 Kcal/Kwh	31.10.2021
9	TPP-2 ACC Fan replacement with energy efficient ENCON blade for 8 Fan.	APC Reduction	1000 Kwh/Day	31.10.2022
10	Inter-connection of TPP-1&2 Cooling tower.	APC Reduction	350 Kwh/Day	31.10.2021
11	Replacement of Old Technology ACW Pumps having Pump Efficiency (65%) with new technology high efficiency (80%) pumps in TPP-1	APC Reduction	400 Kwh/Day	31.10.2022
12	TPP-1 Cooling Tower Fill replacement work.	APC Reduction	200 Kwh/Day	30.09.2021
Total Energy Saving Potential		PHR Reduction = 110 Kcal/Kwh ≈ (1829 TOE) Aux Power Reduction = 8030 Kwh/Day ≈(265 TOE) Total Saving Of Energy ≈(2094 TOE)		

Energy Auditor/Manager

Shriprakash B Gupta
Energy Auditor – EA 5934

Raghvendra Mishra
Energy Auditor – EA-31223

Atulesh Lanjewar
Energy Manager – EM-7737

P C Shekhar Rao
Energy Manager –EA 20580

Vibhav Jaiswal
Energy Manager – EM 3325

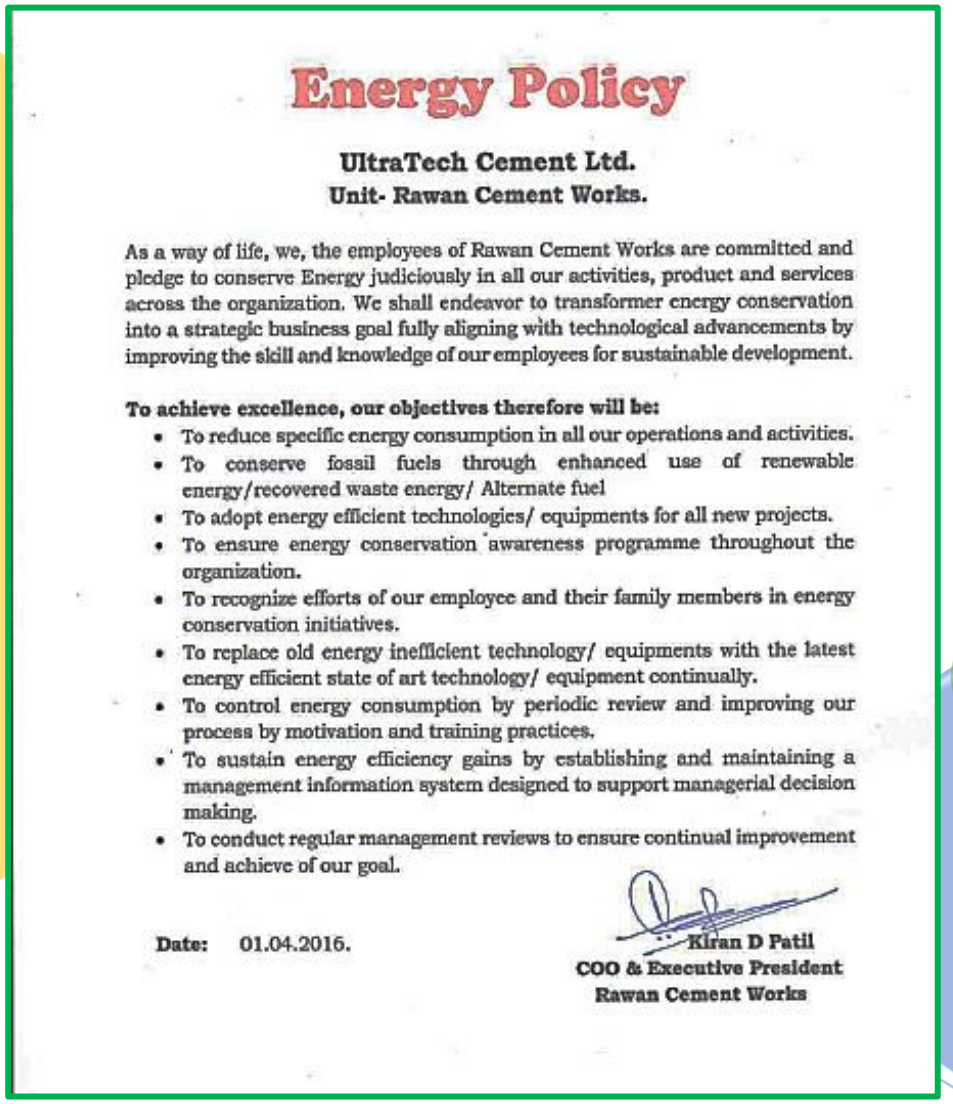
Dinesh Kumar Verma
Energy Manager – EM 5121

Purushottam . K. Singh
Energy Manager – EM 16333

Energy Management Policy

Energy Policy implemented in 2009

- Energy Policy states unit's commitment towards continual energy performance improvement
- Energy policy is communicated at all levels
- Daily Review of Energy & PAT data w.r.t BEST
- Dedicated Energy Cell with fortnightly review
- Three layer Team Structure for stringent Monitoring



Energy Policy

UltraTech Cement Ltd.
Unit- Rawan Cement Works.

As a way of life, we, the employees of Rawan Cement Works are committed and pledge to conserve Energy judiciously in all our activities, product and services across the organization. We shall endeavor to transformer energy conservation into a strategic business goal fully aligning with technological advancements by improving the skill and knowledge of our employees for sustainable development.

To achieve excellence, our objectives therefore will be:

- To reduce specific energy consumption in all our operations and activities.
- To conserve fossil fuels through enhanced use of renewable energy/recovered waste energy/ Alternate fuel
- To adopt energy efficient technologies/ equipments for all new projects.
- To ensure energy conservation awareness programme throughout the organization.
- To recognize efforts of our employee and their family members in energy conservation initiatives.
- To replace old energy inefficient technology/ equipments with the latest energy efficient state of art technology/ equipment continually.
- To control energy consumption by periodic review and improving our process by motivation and training practices.
- To sustain energy efficiency gains by establishing and maintaining a management information system designed to support managerial decision making.
- To conduct regular management reviews to ensure continual improvement and achieve of our goal.

Date: 01.04.2016.

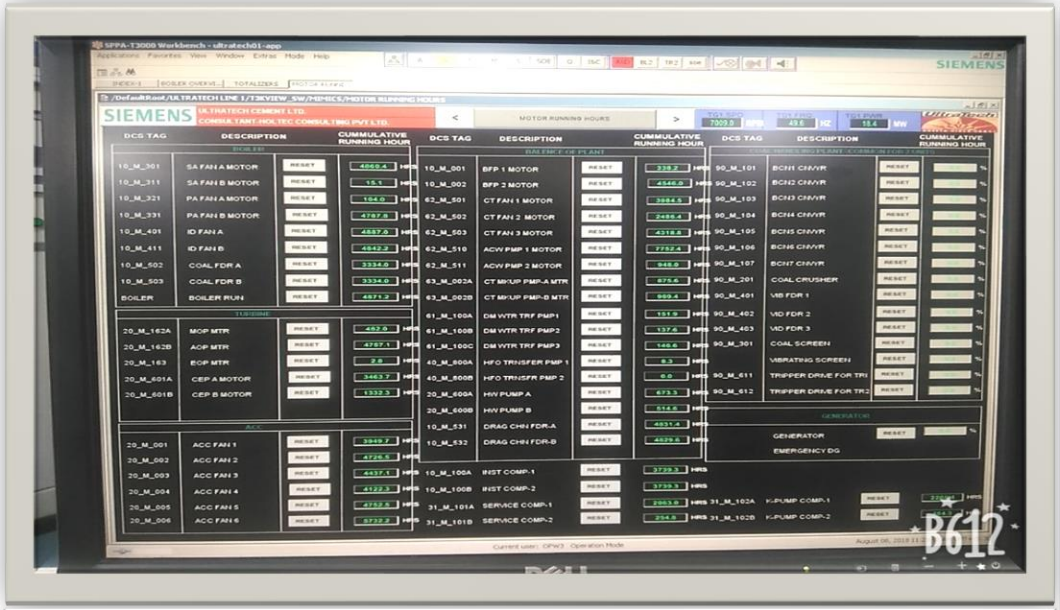
Kiran D Patil
COO & Executive President
Rawan Cement Works

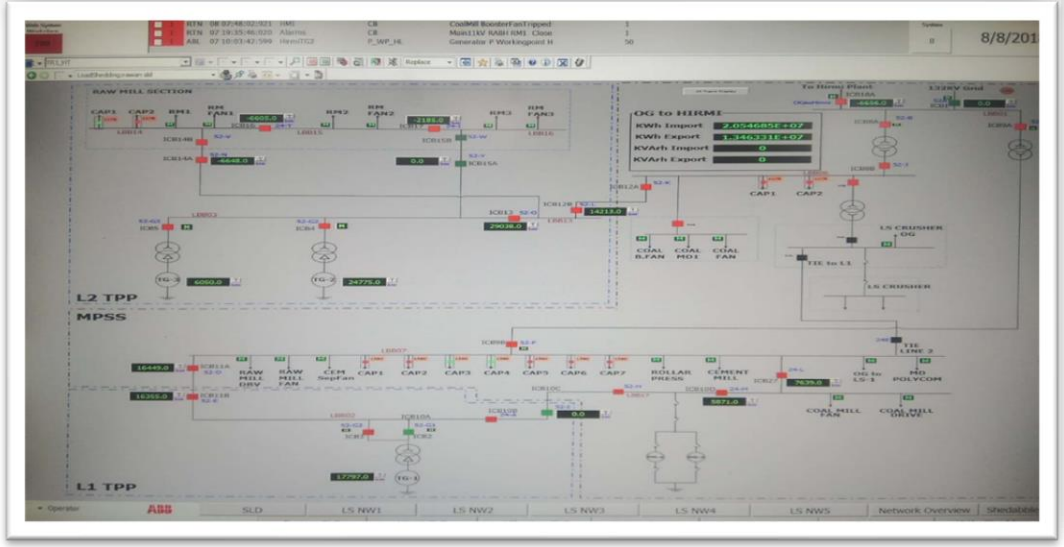
Regular Improvement Projects on Energy Conservation

Real time power consumption data monitoring through online Energy Monitoring System

Energy Management System

Daily Energy Monitoring





Power Generation Planning for HCW & RWCW

HCW _Plant Running plan									
Time	00 to 01	01 to 02	02 to 03	03 to 04	04 to 05	05 to 06	06 to 07	07 to 08	08 to 09
Crusher -1							1.60	1.60	1.60
RM-1	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80
RM-2	4.70	4.70	4.70	4.70	4.70	4.70	4.70	4.70	4.70
Kiln-1	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50
KM-1	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60
CM-1	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50
CM-2	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50
Utilities	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Packing plant	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30
Total power req.	**29.9**	**29.9**	**29.9**	**29.9**	**29.9**	**29.9**	**31.5**	**31.5**	**31.5**

RWCW _Plant Running plan									
Line-2									
Time	00 to 01	01 to 02	02 to 03	03 to 04	04 to 05	05 to 06	06 to 07	07 to 08	08 to 09
LS Crusher	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Raw Mill-1	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Raw Mill-2	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	0.0
Raw Mill-3	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Coal Mill	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
Kiln	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5
Bulk Clinker Loading	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Total power req.	**56.8**	**56.8**	**56.8**	**56.8**	**56.8**	**56.8**	**56.8**	**56.8**	**41.8**

Energy Monitoring, Reporting & Implementation Methodology

Energy Management Cell with clear cut responsibilities.

Daily monitoring of Energy Deviation report.

Benchmarking with National/International/Group Units/Cluster units and action plan for improvement.

Regular study of Equipment's on deviation and their analysis.

Process Evaluation & Identification of Energy Conservation scope.

Feasibility study of suggestions and designing proposals for sanctions.

Promoting energy saving idea generation by shop floor teams and time bound implementation

Organizing Internal and External Energy Audit.

Monitoring & Review Formats

Description	Formats
Daily Co-ordination meeting on Power and Performance review	Daily ɔordination meetir
Review of Daily Power Report for any deviation	Daily Generation Report
Energy Cell Meeting Points Compliance review	Adobe Acrobat Document
Energy Audit (Internal & External) Points Compliance	Adobe Acrobat Document

Certifications

DNV·GL

MANAGEMENT SYSTEM CERTIFICATE

Certificate No: 1127-2007-AQ-IND-UKAS, 1240-2007-AE-IND-UKAS, 268265-2018-AHSO-IND-UKAS
Initial certification date: 22, October, 2003; 25, March, 2004; 30, March, 2004
Valid: 22, October, 2018 - 21, October, 2021; 22, October, 2018 - 21, October, 2021; 21, October, 2018 – 11, March, 2021

This is to certify that the management system of

UltraTech Cement Ltd.
(Unit: Rawan Cement Works)
P.O. Grasim Vihar, District: Baloda Bazaar - Bhatapara - 493 196, Chhattisgarh, India

has been found to conform to the Management System standard:
ISO 9001:2015
ISO 14001:2015
OHSAS 18001:2007

This certificate is valid for the following scope:
Manufacture of clinker and cement including limestone mining

Place and date: Chennai, 30, July, 2018

For the issuing office: DNV GL – Business Assurance, ROMA, No. 10, GST Road, Alandur, Chennai - 600 016, India

Sivadasan Madiyath
Management Representative

Lack of fulfilment of conditions as set out in the Certification Agreement may render this Certificate invalid.

ISO 9001, 14001, OHSAS 18001

DNV·GL

MANAGEMENT SYSTEM CERTIFICATE

Certificate No: 2875-2007-ASA-IND-SAAS
Initial certification date: 06 September 2004
Valid: 16 December 2018 - 16 December 2021

This is to certify that the management system of

UltraTech Cement Ltd.
(Unit.Rawan Cement Works)
P.O. Grasim Vihar, District: Baloda Bazaar, Bhatapara, Raipur - 493 196, CHATTISGARH, India

has been found to conform to the Social Accountability Management System Standard:
SA 8000:2014

This certificate is valid for the following scope:
Manufacture of Cement and Clinker including Limestone Mining

Place and date: Barendrecht, 17 December 2018

For the issuing office: DNV GL – Business Assurance, Zwolseweg 1, 2994 LB, Barendrecht, Netherlands

Erie Koek
Management Representative

Lack of fulfilment of conditions as set out in the Certification Agreement may render this Certificate invalid.

Social Accountability International and other stakeholders in the SA8000 process only recognize SA8000 certificates issued by qualified CBs granted accreditation by SAAS and do not recognize the validity of SA8000 certificates issued by unaccredited organizations or organizations accredited by any entity other than SAAS.

SA 8000

DNV·GL

MANAGEMENT SYSTEM CERTIFICATE

Site certificate No.: 68287CC19-2009-AIS-IND-UKAS
Initial certification date: 31, March, 2010
Valid: 31, March, 2019 - 30, March, 2022

Belongs to Central Office Certificate No.: 68287-2009-AIS-IND-UKAS

This is to certify that the management system of

UltraTech Cement Limited
Unit: Rawan Cement Works
Grasim Vihar Village, PO Rawan, Tehsil: Simga,
Dist.: Baloda Bazar – Bhatapara - 493 196, Chhattisgarh, India

has been found to conform to the Information Security Management System standard:
ISO/IEC 27001:2013

This certificate is valid for the following scope:
Management of information security pertaining to IT services provided by information technology department in accordance with the statement of applicability version 4.0 dated 5-Feb-2019

Place and date: Chennai, 02, April, 2019

For the issuing office: DNV GL – Business Assurance, ROMA, No. 10, GST Road, Alandur, Chennai - 600 016, India

Sivadasan Madiyath
Management Representative

0013

Lack of fulfilment of conditions as set out in the Certification Agreement may render this Certificate invalid.

ISO 27001

Awards: Journey Towards Excellence

ADITYA BIRLA
UltraTech

CII 22th National Award for Excellence in Energy Management 2021

Looking Ahead

- 2008 — Rajiv Gandhi
- 2008 — CII Energy Award
- 2008 — Excellence in Innovation - CWCM
- 2009 — Rajiv Gandhi National Quality
- 2011 — Chairman WCM GOLD Award
- 2014 — State - Energy Efficiency Award by CREDA (Consecutive Since 2014)
- 2015 — IMC Rama Krishna Bajaj Quality Award
- 2016 — DL Shah Quality Award (GOLD)
- 2017 — CSR Excellence Award 2017 & REPRISM 2017
- 2018 — CII 19th National Award of Excellence in Energy Management 2018
- 2019 — ABG REPRISM 2019 Zonal winner
- 2019 — CII 20th National Award of Excellence in Energy Efficient Unit 2019

Thank you!