THE SINGARENI COLLIERIES COMPANY LIMITED
(A Government Company)
2 X 600 MW SINGARENI THERMAL POWER PLANT
Jaipur (V&M)-504216, Mancherial (Dist), T.G.

Ref no: STPP/COML/2026/H Dt: 17. 01.2026

To
The Director,
People's Sentinel forum,
Plot No 174, Ravi Society, Mahendra Hills, East Marredpally,
Secunderabad, Telangana - 500026.

Sir,

Sub: SCCL – Reply to the Objections/suggestions/comments raised by Sri Mohan Reddy Pinninti, dated. 26.12.2025, 29.12.2025 & 08.01.2026 on the filing of Annual Tariff Petition for FY 2026-27 containing Revised Tariff proposal for FY 2026-27 and True up of FY 2024-25 in respect of Singareni Thermal Power Project, Phase-I (2X600 MW) – Reg.

Ref: Lr.No.SECY/TARF/2025/D.No.948/2025, Dt.30.12.2025.

The SCCL reply to the Objections/suggestions/comments raised by Sri Mohan Reddy Pinninti, dated. 26.12.2025, 29.12.2025 & 08.01.2026 on the filing of Annual Tariff Petition for FY 2026-27 containing Revised Tariff proposal for FY 2026-27 and True up of FY 2024-25 in respect of Singareni Thermal Power Project, Phase-I (2X600 MW) is hereby submitted with six copies each.

Thanking you.

Yours sincerely

Chiranjeevi. Ch
17/01/26

Executive Director
STPP, SCCL

Executive Director,
STPP-JAIPUR

Encl: Reply to the 3 sets of objections with 6 copies.

Cc: The Secretary, TGERC, Hyd.

SCCL Reply to the Objections/ suggestions/ comments raised by Sri Mohan Reddy Pinninti, dated. 26.12.2025, 29.12.2025 & 08.01.2026 on the filing of Annual Tariff Petition for FY 2026-27 containing Revised Tariff proposal for FY 2026-27 and True up of FY 2024-25 in respect of 2X600 MW STPP.

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Reply to the Objections/Submissions dated 26.12.2025 raised by Sri. Mohan Reddy Pinninti

With reference to the Objections/Submissions dated 26.12.2025 raised by Sri. Mohan Reddy Pinninti relating to O.P No.64 of 2025 on Annual Tariff Petition for FY 2026-27 containing Revised Tariff Proposal for FY 2026-27 and True Up of FY 2024-25 in respect of Singareni Thermal Power Project ("**STPP**"), Phase-I (2X600 MW), it is submitted that the objections made are not tenable. The point wise replies of SCCL to the submissions raised by Sri. Mohan Reddy Pinninti are provided here in below:

S.No.	Submissions/Objections	SCCL Reply
	Category A: Manpower & Employee Cost Apportioning	
1	**Dedicated vs. Apportioned Staff:** Provide a detailed break-up of the total 42,000+ employees of SCCL. Specifically, list the number of employees physically stationed at STPP (1200 MW) vs. "Corporate/Mining Headquarters" staff whose salaries are partially charged to STPP. A detailed list of corporate employees whose salaries are partially charged to STPP despite not being stationed at the plant.	1. It is humbly submitted that total of 139 SCCL employees consisting of executives and non-executives are stationed at STPP in FY 2024-25. 2. It is humbly submitted that the salaries of corporate headquarters staff charged to STPP is Rs. 17.40 Cr. for FY 2024-25.
2	**Contractual Labor Audit:** Provide the annual payment made to O&M Contractors (e.g., Power Mech) and clarify why high internal "Employee Expenses" are claimed when the majority of plant operations are outsourced.	1. It is humbly submitted that the annual payments made to O&M contractor M/s Powermech projects limited for FY 2024-25 was Rs.97.58 Crores. 2. It is humbly submitted though most of the Operation and maintenance activity of 2X600 MW STPP is run through contract, SCCL employees co-ordinate, supervise and monitor at all levels to align the performance with the strategic objectives of SCCL.

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3. The details of approved station wise O&M expenses for State thermal generating plants are given in the table below:

O&M expenses approved by Hon'ble TGERC for State thermal generating plants for the period FY 2024-25			
Station	**Capacity (MW)**	**O&M Expenses (Rs.Crores)**	**Rs. Lakhs/MW**
KTPS-V	2X250	206.99	41.40
KTPS-VI	500	206.97	41.39
KTPS-VII	800	483.04	60.38
KTPP-I	500	180.28	36.06
KTPP-II	600	204.77	34.13
TGGENCO Total	**3980**	**1471.64**	**36.98**
STPP	**2X600**	**249.47**	**20.79**

4. Normative O&M expenses for 600MW unit as per CERC tariff regulations **is Rs. 25.78 lakh/MW for FY 2024-25.** It can be seen from the above, that the approved O&M expenses of STPP are very less when compared with other state thermal generators plant and normative O&M expenses provided by CERC.

5. In view of the above, the objection that employee expenses are high is not tenable and liable to be rejected.

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3	**Wage Structure Variance:** Compare the average salary of an SCCL employee (governed by NCWA XI) stationed at STPP against the NTPC salary benchmarks for similar supercritical units.	It is humbly submitted that the simple average SCCL employee expenses of STPP NCWA XI employees is around Rs.16 lakhs and the total average salaries of all employees stationed at STPP is around Rs.27 lakhs. Further, it is stated that there is no provision under the Tariff Regulations which provide any salary benchmarks related to NTPC, and as such the said objection is without any merit. Without prejudice, it is to state that the salaries of coal based thermal power plants of 600 MW configuration run by NTPC are not readily available as open document for comparisons.
Category B: Coal Pricing & Quality Transparency		
4	**Mine-Wise Cost of Production:** Provide the actual Cost of Production (COP) for the specific mines (Srirampur/Mancherial) supplying coal to STPP.	It is to humbly submit that the objection seeking disclosure of Mine-Wise Cost of Production supplying coal to STPP pertains to the coal mining operations of SCCL and does not fall within the scope of tariff determination for power generated from Singareni Thermal Power Plant under the Electricity Act, 2003 or the applicable TGERC Tariff Regulations. Further, the Hon'ble APTEL in Judgment dated 28.08.2025 in Appeal No. 256 of 2024, titled as ***SCCL v. TSERC and Ors.***, has held that Regulatory Commission(s) cannot delve into the aspect of coal pricing. SCCL has duly submitted all relevant fuel cost data in terms of actual landed cost at plant end, supported by documentary evidence in page no.483 to page no.497 of submission dated 27.11.2025. Hence, the objections are misconceived and liable to be rejected.
5	**Bridge Linkage Documentation:** Provide a copy of the MOU/Fuel Supply Agreement (FSA) between SCCL (Mining) and STPP (Power) that mandates the 20% premium.	The signed Memorandum of Understanding (MOU) between STPP and SCCL for supply of coal for FY 2024-25 is attached as **Annexure-A.**

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6	**GCV Loss Analysis:** Provide the "Third-Party Sampling Reports" for the last 12 months showing the GCV (As Received) at the plant gate vs. GCV (As Billed) at the mine loading point.	It is to humbly submit that the coal supplied by Singareni Collieries Company Limited (SCCL) to Singareni Thermal Power Plant (STPP) is subject to a joint sampling and analysis mechanism at the coal loading point. The sampling process is carried out jointly by representatives of SCCL and STPP, in accordance with accepted industry practices and sampling procedures. Accordingly, Joint sampling reports for the FY 2024-25 (12 months) are available and attached as **Annexure-B.**
	Category C: O&M & Capitalization	
7	**R&M Expense Break-up**: Provide a list of all "Repair and Maintenance" activities for FY 2024-25 exceeding ₹5 Crores. Clarify if any of these were "Capitalized" (added to the Gross Fixed Assets).	It is to humbly submit that the capital overhaul expenditure of Unit-I incurred during FY 2023-24 and Unit-II incurred during FY 2024-25 qualifies for the given criterion. However, same is not capitalized and are amortized over a period of 6 years beginning from FY 2023-24 and FY 2024-25 respectively as per OEM schedule and the proportionate amount of the same is included in plant & machinery in R&M. The same is also mentioned in our tariff filings.
8	**Auxiliary Power Consumption Log:** Provide the 15-minute block-wise data for Auxiliary Energy Consumption (AEC) for the months where AEC exceeded the 5.75% normative limit.	1. It is to humbly submit that as per the applicable TGERC Generation Tariff Regulations, auxiliary energy consumption is considered and approved on an annual normative/actual basis and not on a 15-minute time-block basis. 2. The energy metering arrangement at Singareni Thermal Power Plant records auxiliary consumption in aggregate, STPP's electrical metering and energy accounting system is designed to record Gross generation and Net sent-out energy on Daily / monthly / annual basis. Block-wise segregation of auxiliary consumption (15-minute) is not available. Further, it is submitted that Block-wise segregation of auxiliary energy is not mandated in absence of intra state ABT. 3. Accordingly, it is to state that SCCL has submitted all relevant and available data in tariff forms as per Hon'ble TGERC regulations.

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Category D: Land Diversion		
9	**Approval of Diversion:** Provide a certified copy of the Government Order (G.O.) or permission from the Revenue Department/District Collector for the diversion of Land at Jaipur (Mancherial) from "Mining/post mining status" to "Industrial Usage" for STPP plant.	1. It is to humbly submit that regarding Land Status and Requirement of G.O. / Diversion Permission, the land utilized for Singareni Thermal Power Plant (STPP) at Jaipur (Mancherial) was acquired exclusively for setting up of the power project and was not part of any operating or post-mining land of SCCL mines. Accordingly, the question of diversion from "Mining / Post-Mining" to "Industrial Use" does not arise. 2. Hence, no separate Government Order (G.O.) or diversion permission from the Revenue Department / District Collector is applicable in this case. The land was identified, acquired, and transferred directly for industrial (power generation) use.
10	**Double capitalization check:** Clarify if the cost of the land used for STPP was already included in the Mining Project Cost of the respective mines. If yes, explain how it is justified to include the same cost again in the STPP Power Project Capital Cost.	3. It is to state that the land used for STPP was never capitalized under the mining project cost of any SCCL mine and was not part of mine lease area or post-mining reclamation land. Therefore, there is no duplication or double capitalization of land cost. The mining projects and STPP are distinct cost centers with separate capitalization records. The request for clarification is answered accordingly. 4. The land was acquired exclusively for setting up STPP and was legitimately capitalized as part of STPP project cost and duly approved by Hon'ble TGERC in its earlier tariff orders.
11	**Valuation Methodology**: Provide the basis for the ₹57.88 Crore (as of 31.01.2025) claimed under "Land" in the capital cost break-up. Does this reflect the actual acquisition cost, or is its "Market Value assessment?	5. Further, the amount of Rs.57.88 Crores as on 31.03.2025 contains actual acquisition cost of land incurred for STPP and consequential impact of Enhanced Compensation paid for land as per Court directives claimed under change in law clause of TGERC tariff regulation. This value is based on acquisition value and not based on current market value or any reassessment. No mark-up, revaluation, or market value adjustment has been applied.

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		6. In view of the above, the objections relating to land diversion, duplication of land cost, and valuation methodology are misconceived. The land utilized for STPP was acquired exclusively for the power project, was never part of any mining project, and the capitalized amount of Rs.57.88 Crore represents the actual acquisition cost incurred and consequential impact of Enhanced Compensation paid for land as per Court directives. The inclusion of the said amount in the capital cost of STPP is justified, prudent, and fully in accordance with applicable regulations. Hence, the objections are liable to be rejected.
Category E: Coal Quality & Quantity Audit:		
12	**Inspection Transparency:** Clarify if CSIR-CIMFR or an independent 3rd party is inspecting coal quality at the loading and unloading points, or if SCCL staffs are "self-certifying" their own supply.	1. It is to humbly submit that the coal supplied by Singareni Collieries Company Limited (SCCL) to Singareni Thermal Power Plant (STPP) is subject to a joint sampling and analysis mechanism at the coal loading point. The sampling process is carried out jointly by representatives of SCCL and STPP, in accordance with accepted industry practices and sampling procedures. Further, the SCCL & STPP labs are accredited by CSIR-CIMFR. 2. The objection alleging that SCCL is "self-certifying" coal quality is not correct. Coal quality is not unilaterally certified by SCCL, it is determined through joint sampling and mutually accepted analysis results. Both supplier (SCCL) and consumer (STPP) participate in and authenticate the sampling and analysis process. Industry practices allow Joint sampling between supplier and consumer especially where both entities are PSUs / Government companies. Further, as Discoms has huge dues to STPP & are not paying billed amount their management also requested for the joint sampling to avoid paying to third party agency from cost aspect. 3. Any variation in coal quality GCV results in credit or debit adjustment based on

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		jointly accepted test results. Such adjustments are fully passed through in the Energy Charge rates (ECR) computation. The monthly JSP are also being submitted to TGPCC from time to time. Therefore, there is no undue benefit to either SCCL or STPP on account of coal quality determination. 4. In view of the above, it is submitted that coal quality supplied to STPP is not self-certified by SCCL. Coal sampling and analysis are carried out jointly by SCCL and STPP at the unloading point, and any quality-related credit or debit is duly accounted for and passed through in the energy charge rates.

In view of the above point wise reply of SCCL, the Objections/Submissions raised by Sri. Mohan Reddy Pinninti relating to O.P No.64 of 2025 on Annual Tariff Petition for FY 2026-27 containing Revised Tariff Proposal for FY 2026-27 and True Up of FY 2024-25 in respect of Singareni Thermal Power Project, Phase-I (2X600 MW) are not tenable.

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Reply to the Objections/Submissions dated 29.12.2025 raised by Sri. Mohan Reddy Pinninti

With reference to the Objections/Submissions dated 29.12.2025 raised by Sri. Mohan Reddy Pinninti relating to O.P No.64 of 2025 on Annual Tariff Petition for FY 2026-27 containing Revised Tariff Proposal for FY 2026-27 and True Up of FY 2024-25 in respect of Singareni Thermal Power Project, Phase-I (2X600 MW), it is to submit that the objections made are not tenable. The point wise replies of SCCL to the submissions raised by Sri. Mohan Reddy Pinninti are given below:

S.No	Submissions/Objections	SCCL Reply
1	**Request for Legible Documentation** Several sections of the submitted PDF filings are of extremely low resolution, making them illegible. Specifically, the pricing data and Annexure-H (Pages 340 to 345) cannot be read. We request a high-resolution, legible copy of the total ARR filing to be made available immediately.	It is to respectfully submit that the reduced resolution of certain annexures was necessitated due to file size constraints while uploading and there has been no intention to withhold or obscure any information. The legible hard copies of all the ARR filings are available for inspection at the SCCL Head Office, Hyderabad. Accordingly, the objection may kindly be ignored.
2	**Coal Pricing Methodology** Please provide the detailed procedure, including the base price, statutory levies, and transport components, used to determine the cost of coal per tonne supplied to the Singareni Thermal Power Plant (STPP) and TGGENCO thermal power stations.	1. It is to humbly submit that STPP, being a generating station, does not determine coal prices and only accounts for the actual landed cost of coal for tariff purposes. 2. Further, the Hon'ble APTEL in Judgment dated 28.08.2025 in Appeal No. 256 of 2024, titled as ***SCCL v. TSERC and Ors.***, has held that Regulatory Commission(s) cannot delve into the aspect of coal pricing. 3. The cost of coal supplied to STPP is determined based on the notified base price of SCCL and signed MOU containing bridge linkage pricing (similar to all bridge linkage customers of SCCL like NTPC, MAHAGENCO), applicable statutory levies and

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		taxes, and actual transportation charges up to the plant end, with quality-related adjustments accounted for through joint sampling. STPP has considered only the actual landed cost of coal for tariff purposes, in accordance with the applicable Tariff Regulations, the details of which are provided in the Petition.
3	**Mine-Wise Operational Data (Last 3 Years)** To evaluate the reasonableness of fuel costs, please provide a mine-wise breakdown for the last three financial years covering: * Number of employees engaged and total manpower costs. * Operational costs (Men & Machinery) involved in coal extraction. * Total quantity of coal mined vs. actual supply. * The final cost of coal per tonne at the pit-head.	1. Singareni Thermal Power Plant (STPP) is a generating station engaged solely in power generation. Mine-wise operational data such as Production details, Mine-specific costs, Labour and equipment deployment pertains exclusively to coal mining operations of SCCL (Mining Division) and not applicable for the present Petition. 2. Under Sections 61 and 62 of the Electricity Act, 2003 and applicable Hon'ble TGERC generation Tariff Regulations the Commission examines actual landed cost of coal at plant end, Quantity and quality of fuel consumed and Energy charge computation. Mine-wise operational efficiency or cost structure of the coal supplier is not a prescribed input and not relevant for determination of generation tariff. 3. In view of the above, the objection seeking mine-wise operational data for the last three years pertains to the coal mining operations of SCCL and is outside the purview of the Petitioner generating station. Such information is neither available with STPP nor required under the Electricity Act, 2003 or the applicable Tariff Regulations for determination of generation tariff. The Petitioner has already submitted all relevant fuel cost data based on actual landed cost at plant end. Hence, the objection is misconceived and liable to be rejected.

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4	**Capital Expenditure** Please provide the Capital Cost of STPP based on finalized, audited figures rather than provisional estimates.	It is to submit that the certified copies of the detailed capital cost along with relevant documents for FY 2024-25 is submitted as annexure-E in main petition O.P No 64 of 2025 dated 27.11.2025.
5	**Social Overheads** Provide a detailed breakup of the amounts spent on social overheads and specify the quantum of these expenses that have been loaded onto the ARR and passed through to consumers.	It is to humbly submit that for FY 2024-25, social overheads under the balance Mandatory capital expenditure under MoEF clearance amounting to Rs. 0.67 Crores have been capitalized as per the relevant clause of environmental clearance and put for approval of this Hon'ble Commission. These include installation of RO plants in surrounding villages and procurement of medical equipment for the Primary Health Centre. The expenditure has been prudently incurred, directly related to the project's Mandatory capital expenditure, and only the servicing of capitalised amount has been reflected in the ARR in line with Hon'ble TGERC tariff regulations.
6	**Transfer of Geographical Advantages** Explain the mechanism by which the geographical proximity of SCCL mines to STPP and TGGENCO plants is being passed on to the utilities. Currently, the pricing does not seem to reflect the logistical advantages of being pit-head or near-pit-head stations.	It is to humbly submit that the geographical proximity of SCCL mines to STPP is fully reflected in the significantly lower transportation cost of around only Rs.120 per tonne. This reduced transportation cost directly lowers the landed cost of coal and the benefit is entirely passed through to the TGDISCOMs through lower energy charge rates. There is no separate or additional mechanism prescribed under the applicable regulatory framework for transfer of geographical advantage beyond the actual landed cost methodology already followed. Accordingly, the contentions raised by the objector are devoid of merit and are liable to be rejected.
7	**Impact of Coal Pricing on Consumer Tariffs** It is observed that the high rate of coal supplied by	It is to submit that STPP has no involvement in coal pricing or the pricing policy of SCCL and is solely a consumer of coal at actual

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	SCCL has led to an abnormal increase in generation costs, resulting in a direct tariff burden on the general public. We seek a justification for these rates compared to national benchmarks.	landed cost. The Hon'ble APTEL in Judgment dated 28.08.2025 in Appeal No. 256 of 2024, titled as ***SCCL v. TSERC and Ors.***, has held that Regulatory Commission(s) cannot delve into the aspect of coal pricing. Accordingly, the actual landed cost of coal is an expense for STPP, which is allowed as pass-through in terms of the Tariff Regulations. Any allegations and seeking justification for high rate of coal by SCCL is beyond the control or purview of STPP. Accordingly, the objection is misconceived and liable to be rejected.
8	**Quality Control and Grade Slippage** SCCL has been supplying lower-grade coal at costs higher than comparable Coal India Limited (CIL) rates. We request data on the grade variations and grade slippages encountered between the point of dispatch and the point of receipt, which have led to significant financial losses and operational inefficiencies for TGGENCO.	It is to respectfully submit that SCCL coal pricing to STPP is based on notified grades, transportation, and statutory levies, and any quality-related impact is transparently passed through to STPP. Minor grade variations or slippages between mine dispatch and plant receipt are natural, unavoidable, and fully addressed through joint sampling and energy charge adjustments. Accordingly, the objection regarding higher cost or financial loss is misconceived and liable to be rejected.
9	**Provide details on coal inspection at loading points (mines) and unloading points: Any Tripartite** i. Whether any third-party agency was engaged; if so, provide details of the agency, their inspection reports, and deviation notes Number of deviations noticed against the Fuel Supply MOU between SCCL & STPP and actual supply quantity. ii. Quantity slippage (actual vs. as per agreement). iii. Moisture component variations noticed. iv. Give details of debit/credit quantity and bill raised	1. It is to humbly submit that the coal supplied by Singareni Collieries Company Limited (SCCL) to Singareni Thermal Power Plant (STPP) is subject to a joint sampling and analysis mechanism at the coal loading point. The sampling process is carried out jointly by representatives of SCCL and STPP, in accordance with accepted industry practices and sampling procedures. 2. Coal quality is not unilaterally certified by SCCL, it is determined through joint sampling and mutually accepted analysis results. Both supplier (SCCL) and consumer (STPP) participate in and

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	details may be furnished.	authenticate the sampling and analysis process. Industry practices allow Joint sampling between supplier and consumer especially where both entities are PSUs / Government companies. 3. Any variation in coal quality GCV results in credit or debit adjustment based on jointly accepted test results. Such adjustments are fully passed through in the Energy Charge rates (ECR) computation. The monthly JSP are also being submitted to TGPCC from time to time. The details of credit or debit adjustments for FY 2024-25 are attached as **Annexure-C**. Therefore, there is no undue benefit to either SCCL or STPP on account of coal quality determination. 4. Further, it is to submit that STPP always remains at better positions in the merit order compared to other state thermal generators of Telangana and is generating power as per the schedules given by TGSLDC. The better position in state merit order is an evidence of lesser energy charge of STPP.
10	**Monopoly Pricing Concerns** It appears that SCCL is leveraging its monopoly position to generate windfall profits by imposing high costs on TGGENCO and Discoms. We request a disclosure of how these profits are distributed and whether this "arm-twisting" pricing policy is consistent with the public interest.	1. It is to submit that STPP has no involvement in coal pricing or the pricing policy of SCCL and is solely a consumer of coal at actual landed cost. The tariff of a generating company is determined in terms of the Tariff Regulations, and there is no provision under which the manner of price of coal levied by the coal company can become a subject matter of scrutiny by this Hon'ble Commission. 2. Further, the Hon'ble APTEL in Judgment dated 28.08.2025 in Appeal No. 256 of 2024, titled as ***SCCL v. TSERC and Ors.***, has held that Regulatory Commission(s) cannot delve into the aspect

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		of coal pricing. Any allegation of monopoly pricing or windfall profits by SCCL is beyond the purview of present tariff petition filed by STPP. 3. The energy charges submitted by STPP reflect only landed coal costs, including statutory levies and transportation, and are fully compliant with regulatory norms. Accordingly, the objection is misconceived and liable to be rejected.

In view of the above point wise reply of SCCL, the Objections/Submissions raised by Sri. Mohan Reddy Pinninti relating to O.P No.64 of 2025 on Annual Tariff Petition for FY 2026-27 containing Revised Tariff Proposal for FY 2026-27 and True Up of FY 2024-25 in respect of Singareni Thermal Power Project, Phase-I (2X600 MW) are not tenable.

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Reply to the Objections/Submissions dated 08.01.2026 raised by Sri. Mohan Reddy Pinninti

With reference to the Objections/ Submissions dated 08.01.2026 raised by Sri. Mohan Reddy Pinninti relating to O.P No. 64 of 2025 on Annual Tariff Petition for FY 2026-27 containing Revised Tariff Proposal for FY 2026-27 and True Up of FY 2024-25 in respect of Singareni Thermal Power Project ("**STPP**"), Phase-I (2X600 MW), it is submitted that the objections made are not tenable. The point wise replies of SCCL to the submissions raised by Sri. Mohan Reddy Pinninti are provided herein below:

S No.	Submissions/Objections	SCCL Reply
1	**Reference:** Volume-II, Page 223; Annexure-L; Form 10 (Tariff Forms); Annexure-F (Pages 345-369). **i. Gist of the Provision/Statement in the Filing:** Actual SHR for FY 2024-25 is **2296.3 kcal/kWh** against normative 2300 kcal/kWh; projections for FY 2025-26 and 2026-27 at 2300 kcal/kWh. **ii. Suggestion/Comment:** Allow SHR gains in true-up but share 50:50 between generator and consumers as per TSERC regulations. **iii. Justification/Rationale:** The positive deviation of -3.7 kcal/kWh in FY 2024-25 indicates efficiency gains, resulting in savings of approximately 0.009 MT of coal, equivalent to about Rs 3.42 Cr at a coal price of Rs 3800 per tonne. This efficiency improvement reduces energy charges by roughly Rs 0.004 per unit on 7501 MU ex-bus sales. Benchmarking against CERC norms of 2275 kcal/kWh and NTPC peers achieving 2250-2300 kcal/kWh demonstrates commendable performance, especially considering the low Plant Load Factor (PLF) of 71.83% against the normative 85%. Historically, there has been an improvement from 2320 kcal/kWh in FY 2022-23. As	1. It is humbly submitted that the actual SHR achieved during FY 2024–25 is marginally better than the normative SHR. Any gain arising there from may be considered by the Hon'ble TGERC at the time of true-up. 2. However, it is respectfully submitted that during true-up of Energy Charge Rates (ECR), the calculation of gain or loss is based on the combined effect of Station Heat Rate (SHR), Auxiliary Consumption, and Specific Oil consumption, and not on individual parameters. 3. Since ECR is computed as a single integrated figure, it is not feasible to calculate gain/loss separately for SHR, Auxiliary, or Oil. Accordingly, any gain arising from improved operational performance is to be shared between the generator STPP and TGDISCOMs based on the total ECR in the ratio prescribed under the applicable TGERC Tariff Regulations. 4. The projections for FY 2025–26 and FY 2026–27 have been kept at the normative SHR as approved by Hon'ble TGERC in STPP MYT order dated 28.06.2024.

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	gains from controllable parameters like SHR should be shared to benefit consumers, a 50:50 sharing mechanism as per TSERC regulations is recommended to ensure equitable distribution.	
2	**Reference:** Volume-II, Pages 189, 223, 241, 243, 247; Form 12 (Tariff Forms). **i. Gist of the Provision/Statement in the Filing:** Actual auxiliary consumption for FY 2024-25 is 6.04% (excluding 2.519 MU for township/construction) against normative 5.75%; projections for FY 2025-26 and 2026-27 at 5.75%. **ii. Suggestion/Comment:** Disallow excess auxiliary consumption (0.29% deviation) amounting to approximately Rs 9.5 Cr in true-up unless justified with evidence (e.g., grid dispatch logs); direct SCCL to implement efficiency measures like VFD retrofits (Q2-Q3 2026, Rs 10-15 Cr), AI for low-load optimization (Q2 2026), cooling upgrades (FY 2026-27, Rs 20-30 Cr), and benchmark to 5.25% ongoing. **iii. Justification/Rationale:** The excess auxiliary consumption leads to approximately 24 MU loss, translating to about Rs 9.5 Cr at an energy charge of Rs 3.98 per unit, thereby increasing the effective tariff by roughly Rs 0.013 per unit. This deviation is attributed to low load operations (55-85%) due to grid demand, but it is considered controllable through better scheduling. Benchmarking reveals that CERC norms for 600 MW supercritical plants are 5.25%, while NTPC peers achieve 5-5.5% (e.g., Talcher at 5.5%). The historical persistence of 5.8-6.1% in prior years indicates untapped potential for 5-10% reduction via	1. It is humbly submitted that STPP is already conducting biannual energy audits as part of its regular efficiency monitoring framework and further STPP marginal excess auxiliary consumption during FY 2024–25 is primarily attributable to sustained low-load and part-load operation imposed by grid dispatch conditions by TGSLDC in view of CEA flexible operation regulations, which stipulates thermal generating units to operate as low as 55% of full load operation based on grid demand. 2. The Central Electricity Regulatory Commission (CERC) has explicitly recognized the adverse impact of low-load and flexible operation on station parameters, including auxiliary consumption and heat rate. Accordingly, CERC Provides compensation for part-load/low-load operation by recognizing that deterioration in operating parameters under such conditions is unavoidable and beyond the control of generators. 3. Hon'ble TGERC is requested to allow actual Auxiliary Consumption to compensate for low load operation of units for truing up of FY 2024-25. 4. The projections for FY 2025–26 and FY 2026–27 have been maintained at the normative level as approved by Hon'ble TGERC in STPP MYT order dated 28.06.2024.

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	best practices. Under TSERC regulations, a prudence check necessitates disallowing such inefficiencies to protect consumer interests and encourage operational improvements.	
3	**Reference:** Volume-II (Entire Document, including Index Pages 3-4, Operating Norms Pages 10-11, Energy Charges Pages 11-20, Commission Directives Pages 24-25); Annexures I (Pages 395-426), K (Pages 454-458), O; Tariff Forms F10 and F12. **i. Gist of the Provision/Statement in the Filing:** No mention of energy audits conducted for STPP; auxiliary deviations justified by low load without audit references or efficiency measures. **ii. Suggestion/Comment:** Mandate independent energy audit by BEE-accredited agency (Q1 2026, Rs 1-2 Cr) and submit observations/measures in next filings; disallow excess auxiliary until improvements demonstrated. **iii. Justification/Rationale:** The absence of energy audit references hinders the verification of efficiency claims under Sections 61(d) and 62 of the Electricity Act, 2003. External sources, such as the CAG 2020 audit focusing on project setup rather than operations, and SCCL annual reports for 2022-23 emphasizing financials, confirm that no operational energy audits have been documented. Persistent deviations result in approximately Rs 9.5 Cr annual excess costs, suggesting significant transparency gaps. Mandating audits would ensure prudence in operations and safeguard consumers from bearing the costs of inefficiencies, aligning with regulatory requirements for demonstrable improvements.	It is humbly submitted that STPP is already conducting biannual energy audits as part of its regular efficiency monitoring framework, with the most recent audit carried out in January 2024. The marginal deviation in auxiliary consumption during FY 2024–25 is attributable to sustained low-load operation imposed by grid conditions and not due to absence of efficiency measures. The latest STPP mandate energy audit is attached as **Annexure-D.**

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4	**Reference:** Annexure-H (Pages 373-394); Volume-II, Page 223 (Coal Consumption and GCV). **i. Gist of the Provision/Statement in the Filing:** Internal coal transfer price at Rs 3762/tonne (FY 2024-25, GCV 3762 kcal/kg); projected Rs 3837/tonne for FY 2026-27 under MoU. **ii. Suggestion/Comment:** Provide justification for ~75-80% premium over CIL G10 coal (~Rs 2100-2200/tonne); direct reduction in premiums leveraging MoC memo (Annexure-G, Pages 370-372) for efficiency; disallow excess coal cost of approximately Rs 843 Cr attributable to unjustified premium. **iii. Justification/Rationale:** The excess premium of approximately Rs 1600-1700 per tonne generates about Rs 843 Cr in revenue on 4.96 MT of coal, inflating energy charges by roughly Rs 1.12 per unit on 7501 MU ex-bus and adding Rs 0.50-0.60 per unit to overall tariffs. There has been a historical 15% escalation from Rs 3250 per tonne in 2021-22 without adequate rationale. As a pit-head state-owned entity, SCCL should align its pricing closer to CIL production costs of Rs 1500-1800 per tonne to minimize consumer burden and reduce subsidy requirements, promoting efficiency and affordability in the power sector.	It is to submit that STPP has no involvement in coal pricing or the pricing policy of SCCL and is solely a consumer of coal at actual landed cost. The Hon'ble APTEL in Judgment dated 28.08.2025 in Appeal No. 256 of 2024, titled as ***SCCL v. TSERC and Ors.***, has held that Regulatory Commission(s) cannot delve into the aspect of coal pricing. Further, it has also been held that as per extant regulatory framework, STPP is entitled to landed cost of coal, which is inclusive of premium (if any) levied by SCCL. Notably, as on date, there is no stay operating on the aforementioned Judgment dated 28.08.2025 passed by Hon'ble APTEL, in the Civil Appeal No. 014556-014557/2025 Registered on 03-12-2025 filed by Respondents before Hon'ble Supreme Court. Further, this Hon'ble Commission, being a subordinate authority to Hon'ble APTEL has to abide by the directions given in the above judgment. Further, the scope of remand wherein the directions of a superior court are to be implemented is very specific and limited. The subordinate forum, such as this Hon'ble Commission in the present case, cannot at all deviate from any of the principles decided by the appellate forum. Accordingly, the actual landed cost of coal is an expense for STPP, which ought to be allowed as pass-through in terms of the Tariff Regulations. Any allegations and seeking justification for alleged high rate of coal by SCCL is beyond the control or purview of STPP. In view of the above, the objection is misconceived and liable to be rejected.
5	**Reference:** Annexure-K (Audited Accounts); Volume-II (O&M Sections, e.g., Pages 189-247).	1.It is humbly submitted that total of 139 SCCL employees

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i. Gist of the Provision/Statement in the Filing: O&M expenses Rs 262.86 Cr (Rs 21.91 lakh/MW); employee costs Rs 134.58 Cr (~51% O&M); no details on apportionment, employee numbers, or outsourcing/contracts.

ii. Suggestion/Comment: Provide details on corporate office employee cost apportionment to STPP, number of employees (infer 500-600 at 0.4-0.5/MW norm), outsourcing/contract costs (estimate 30-40% O&M, Rs 79-105 Cr); compare O&M per MW with NTPC/best stations; disallow unapportioned/excess O&M costs of approximately Rs 29.18 Cr and benchmark to Rs 20 lakh/MW.

iii. Justification/Rationale: Low productivity levels of 1707 tonne per man-year compared to CIL's over 2000, combined with escalations such as bonuses amounting to Rs 800 Cr from PAT of Rs 6394 Cr, are passed on without corresponding efficiency gains. Benchmarks show NTPC at Rs 23-25 lakh per MW (Vindhyachal at Rs 23.1), with best performers like Talcher at Rs 20 lakh and Adani Mundra at Rs 20-22 lakh. This results in excess O&M of approximately Rs 29.18 Cr (claimed versus prudent Rs 233.68 Cr). Transparency in apportionment and details is essential for prudence checks, and disallowing unapportioned costs would prevent over-recovery, ensuring fair tariffs for consumers.

consisting of executives and non-executives are stationed at STPP in FY 2024-25. The salaries of corporate headquarters staff charged to STPP is Rs. 17.40 Cr. for FY 2024-25.

2.It is humbly submitted though most of the Operation and maintenance activity of 2X600 MW STPP is run through contract, SCCL employees co-ordinate, supervise and monitor at all levels to align the performance with the strategic objectives of SCCL.

3.The details of approved O&M expenses station wise for State thermal generating plants is given in table below:

O&M expenses approved by Hon'ble TGERC for State thermal generating plants for the period FY 2024-25			
Station	**Capacity (MW)**	**O&M Expenses (Rs.Crores)**	**Rs. Lakhs/MW**
KTPS-V	2X250	206.99	41.40
KTPS-VI	500	206.97	41.39
KTPS-VII	800	483.04	60.38
KTPP-I	500	180.28	36.06
KTPP-II	600	204.77	34.13
TGGENCO Total	**3980**	**1471.64**	**36.98**
STPP	**2X600**	**249.47**	**20.79**

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		4. As per the above table it is to state that the approved O&M expenses of STPP are very less when compared with other state thermal generators plant and normative O&M expenses provided by CERC. Normative O&M expenses for 600MW unit as per CERC tariff regulations **is Rs. 25.78 lakh/MW for FY 2024-25.** 5. In view of the above, the objection that employee expenses are high is not tenable.
6	**Reference:** Annexure-E (Pages 305-344); Volume-II (Capital Cost Sections). **i. Gist of the Provision/Statement in the Filing:** Audited capital cost Rs 8,803.40 Cr vs. GFA Rs 7,748.234 Cr (difference Rs 1,055.17 Cr, likely township/non-core/social overheads excluded from tariff). **ii. Suggestion/Comment:** Provide breakdown of Rs 1,055.17 Cr excluded assets; confirm social overheads and no indirect O&M charging; disallow any potential over-recovery amounting to approximately Rs 222 Cr if indirectly charged. **iii. Justification/Rationale:** The discrepancy suggests possible inadvertent inclusion in past tariffs, with a potential impact of about Rs 222 Cr if charged to consumers. Verifying exclusions is crucial to ensure no undue burden on consumers, aligning with prudence principles under the Electricity Act and preventing any indirect cost pass-through via O&M or other means.	1. It is humbly submitted that the audited capital cost of Rs. 8,803.40 Crore represents the total expenditure reflected in the books of accounts of STPP. 2. However, for the purpose of tariff determination, STPP has considered only the Gross Fixed Assets (GFA) approved by the Hon'ble TGERC up to the previous year, amounting to Rs. 7,748.234 Crore. 3. The difference of Rs.1,055.17 Crores arises solely due to the regulatory approach of considering only approved and admitted assets, and not due to any inclusion or exclusion at the discretion of the Petitioner. 4. It is to submit that the detailed item-wise breakup has already been provided at Annexure-L (Pages 471–473) of the OP 64 of 2025 dated 27.11.2025. Accordingly, the contention regarding indirect recovery or over-recovery is misconceived and liable to be rejected.

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7	**Reference:** Volume-II, Pages 22-24 (FGD). **i. Gist of the Provision/Statement in the Filing:** Request for 1.5% auxiliary increase for FGD (total 7.25%). **ii. Suggestion/Comment:** Justify 1.5% increase vs. CERC 1.5%; provide impact on ARR. **iii. Justification/Rationale:** While CERC allows 1.5% for 600 MW plants, STPP's base auxiliary of 5.75% is already higher than CERC's 5.25%; justification is needed to avoid double-counting and ensure minimal impact on the Aggregate Revenue Requirement, protecting consumers from unnecessary tariff escalations.	1. It is humbly submitted that the normative auxiliary consumption of 5.75% considered for STPP is in line with CERC norms applicable to 600 MW units with Induced Draft cooling towers. The additional auxiliary consumption sought for FGD operation is a separate and incremental requirement, consistent with CERC provisions, and does not result in any double counting. 2. Further, during true-up of the relevant year the actual cost of FGD system together with its effect on the tariff components and additional auxiliary energy shall be submitted after commissioning of the system along with supporting data, in truing up petition for consideration by the Hon'ble Commission.
8	**Reference:** Volume-II, Pages 20-21 (Fly Ash). **i. Gist of the Provision/Statement in the Filing:** Fly ash sales revenue Rs 2.28 Cr (FY 2024-25). **ii. Suggestion/Comment:** Provide details on how revenue offsets costs; utilization rate vs. norms. **iii. Justification/Rationale:** Such revenue should be utilized to reduce net costs passed on to consumers; verifying compliance with environmental norms and the utilization rate would ensure that benefits are appropriately credited, enhancing transparency and consumer welfare.	1. It is humbly submitted that as per the MoEF notification, thermal power plant shall be responsible to utilize 100 per cent ash (fly ash and bottom ash) generated during that year. 2. Non-compliant thermal power plants shall be imposed with an environmental compensation of Rs. 1000 per ton on un-utilized ash during the end of financial year based on the annual reports submitted. 3. STPP is holding the Fly ash utilization reserve funds separately as there is liability for non utilization of 100% ash generated in thermal power plant. The same is clearly shown in annual accounts. The revenue is utilised to offset fly ash management and utilisation costs, ensuring that no undue burden is passed on to consumers.

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		4. Hon'ble Commission is requested to treat fly ash sale fund as a dedicated environmental compliance reserve instead of non tariff income. Accordingly, the contention raised by the objector is addressed.
9	**Reference:** Volume-II, Pages 21-22 (Incentives). **i. Gist of the Provision/Statement in the Filing:** Incentive claims projected Rs 18 Cr for FY 2026-27. **ii. Suggestion/Comment:** Provide basis for claims; tie to PLF >85%. **iii. Justification/Rationale:** Incentives must align with actual performance; given the low historical PLF of 71.83%, projections should be scrutinized to ensure they are tied to achieving above 85% PLF, preventing unwarranted payouts and maintaining regulatory fairness.	It is humbly submitted that STPP has demonstrated the capability to achieve PLF above 85% in several previous years. The projected incentive for FY 2026–27 is a performance-linked estimate strictly in accordance with the applicable Tariff Regulations and is contingent upon achieving PLF beyond the normative threshold of 85%. Actual incentive claim, if any, shall be determined based on verified performance at the time of true-up.
10	**Reference:** Annexure-D; Volume-II (True-Up Sections, e.g., Pages 189-247). **i. Gist of the Provision/Statement in the Filing:** True-up claims include O&M excess Rs 9.18 Cr; higher working capital interest per APTEL. **ii. Suggestion/Comment:** Disallow excesses including higher working capital interest of approximately Rs 13.1 Cr and prior true-up gaps (~Rs 100-150 Cr annually) in true-up if unbenchmarked or uncorrected. **iii. Justification/Rationale:** Gaps in prior years indicate persistent issues that require resolution; a	It is humbly submitted that reference pages nos provides pertains to Hon'ble TGERC tariff order dated 29.04.2025 regarding truing up of FY 2023-24 hence no comments.

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	prudence check under regulatory norms necessitates disallowing such excesses to protect consumers from recurring inefficiencies and over-claims.	
11	**Reference:** Overall Filing (PLF References, e.g., Page 223). **i. Gist of the Provision/Statement in the Filing:** Low PLF 71.83% vs. normative 85%, amplifying SHR/auxiliary issues. **ii. Suggestion/Comment:** To TGGENCO/TSDISCOMs: Provide mitigation strategies for low PLF impact on tariffs. **iii. Justification/Rationale:** Underperformance compared to NTPC peers (75-80%) increases overall costs; developing and sharing mitigation strategies for better scheduling would help minimize tariff impacts and improve system efficiency.	It is humbly submitted that the lower PLF during the relevant period is attributable to grid-imposed backing down and system-level dispatch constraints given by TGSLDC and not due to any technical or operational deficiency of the generating station. Mitigation strategies relating to scheduling and optimization lie within the domain of TGSLDC and the distribution licensees. Accordingly, the issue raised does not pertain to the Petitioner STPP and may not be considered.
12	**Reference: Overall Filing.** **i. Gist of the Provision/Statement in the Filing:** No specific allocation for subsidized categories. **ii. Suggestion/Comment:** To State Government: Direct 20-25% power to agricultural/BPL consumers at reduced rates. **iii. Justification/Rationale:** Leveraging the pit-head advantages of STPP for social welfare would enable allocation of 20-25% power to agricultural and Below Poverty Line (BPL) consumers at reduced rates, thereby reducing the overall subsidy burden on the state and promoting equitable access to affordable energy.	It is humbly submitted that the issue of allocation of power to subsidized consumer categories and provision of concessional tariffs falls outside the scope of the present ARR petition filed by the 2X600MW STPP generating station. Such matters are governed by State Government policy and are to be addressed through the distribution licensees. Accordingly, the objection does not pertain to the Petitioner STPP and may not be considered in the present proceedings.

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13	**Reference:** Overall Filing (Summary of Excesses). **i. Gist of the Provision/Statement in the Filing:** Total claimed costs ~Rs 3352 Cr include premiums, inefficiencies. **ii. Suggestion/Comment:** Disallow total non-prudent/avoidable costs of approximately Rs 1,117 Cr (comprising coal pricing premium Rs 843 Cr, excess O&M Rs 29.18 Cr, excess auxiliary Rs 9.5 Cr, excess working capital interest Rs 13.1 Cr, and potential over-recovery from excluded assets Rs 222 Cr); consider adopting stricter CERC norms (e.g., 5.25% auxiliary consumption) for future control periods. **iii. Justification/Rationale:** The consolidated excesses significantly burden consumers and contradict the efficiency and consumer protection principles enshrined under Sections 61 and 62 of the Electricity Act, 2003. While the SHR efficiency gain of Rs 3.42 Cr is commendable, it is substantially offset by the above inefficiencies and unjustified costs. Disallowance of these non-prudent costs, along with mandating greater transparency and efficiency measures, is essential to ensure fair and reasonable tariffs.	It is humbly submitted that all costs claimed in the present filing have been computed strictly in accordance with the applicable TGERC Generation Tariff Regulations and are subject to prudence check by the Hon'ble Commission. The allegations of non-prudent or avoidable costs are either outside the control of the generating station or based on incorrect assumptions. Accordingly, the objections seeking aggregate disallowance and adoption of norms beyond the applicable regulations are misconceived and liable to be rejected.

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In view of the above point wise reply of SCCL, the Objections/Submissions raised by Sri. Mohan Reddy Pinninti relating to O.P No.64 of 2025 on Annual Tariff Petition for FY 2026-27 containing Revised Tariff Proposal for FY 2026-27 and True Up of FY 2024-25 in respect of Singareni Thermal Power Project, Phase-I (2X600 MW)are not tenable.

Singareni Collieries Company Ltd., SCCL STPP-Jaipur

(24)

B. Anil Goud
BH 462521

తెలంగాణ तेलंगाना TELANGANA

Tran Id: 240905143629061946
Date: 05 SEP 2024, 02:39 PM
Purchased By:
D. RAVI PRASAD
S/O KRISHNA MURTHY
R/o HYDERABAD
For Whom
SCCL, MARKETING G.M

B. ANIL GOUD
LICENSED STAMP VENDOR
Lic. No. 16-10-032/1999
Ren.No. 16-10-033/2023
11-6-475, Devi Bagh, Nampally,
Hyderabad
Ph 9908847108

MEMORANDUM OF UNDERSTANDING

This Memorandum of Understanding is made on this 12th day of **September 2024** (the "MOU) at Hyderabad.

BETWEEN

The Singareni Collieries Company Limited, an existing company under the Companies Act, 1956, having its registered office at Kothagudem Collieries (PO) 507 101, Bhadradri District, Telangana State (hereinafter referred to as the **"Seller"** which expression shall, unless the context otherwise specifies mean and include its successors and permitted assigns) of the FIRST PART

AND

M/s. Singareni Thermal Power Plant, a generating station, established by M/s SCCL as a part of its diversification plan, having its office at Pegadapalli Village, Jaipur (M), Dist., Mancherial, Telangana State (hereinafter referred as the "Purchaser" with expression shall unless the context otherwise specifies means and includes their successors and permitted assigns) of the SECOND PART.

(The Seller and the Purchaser are hereinafter collectively referred to as the **"Parties").**

GENERAL MANAGER (E&M,
STPP, JAIPUR

G.M. (Mktg.)
SCCL., Hyderabad

(25)

MEMORANDUM OF UNDERSTANDING

BETWEEN

STPP AND SCCL

FOR SUPPLY OF 6.00 MMTPA COAL FOR THE PERIOD

01.04.2024 To 31.03.2025

Whereas the Seller is a Government Company engaged in mining and sale of coal including coal exploration, design, construction, project management development, operations and allied consultancy services.

Whereas the Purchaser is allotted Naini Coal Block in Odisha for captive mining to meet the coal requirement of SCCL TPP , 2 x 600 MW (Stage-I) and Ministry of Coal, GoI, recommended Bridge Linkage from M/s. SCCL vide File No. 23014/2/2016/CPD, dt. 11.4.2016 for a period of 3 years from the date of allotment of Coal Block as per the terms and conditions of OM No.23021/3/2015-CPD, dt. 8.2.2016. Further, as per the Minutes of SLC (LT) meeting for Power sector held on 10.04.2018, Bridge Linkage has been extended up to 2023 and again as per the Minutes of SLC (LT) meeting for Power sector held on 13.02.2024, bridge linkage was extended for another one year up to 2025.

As per the SLC (LT) Minutes dated 13.02.2024, a letter was addressed to the CCO, Kolkata for coal quantification for the bridge linkage on tapering basis for STPP for the FY 2024-25. The CCO (HQ), Kolkata vide Lr.No. CC/MCBA/POLICY/BRIDGE LINKAGE/2018-19/Vol II, dt. 06.05.2024 has quantified the Agreed requirement of Coal as 2.91 MT for Singareni TPP (Unit-1 & 2) for the FY 2024-25.

Whereas the Purchaser is in requirement of coal for their coal based stations and requested the Seller to supply additional quantity over and above the Bridge Linkage coal to meet their generation requirement. The Purchaser agreed for payment of additional price towards supply of coal by the Seller

And whereas the Seller has agreed in principle to supply coal to the Purchaser for additional price from e-auction basket as the Seller is having a mandate to sell 10% of production under e-auction as per New Coal Distribution Policy (NCDP) and as per Bridge Linkage guidelines issued by Ministry of Coal/GoI.

NOW THEREFORE, in consideration of the premises and mutual covenants herein contained, the Parties hereto agree as follows:

1.0 The Purchaser requested Seller to supply **6.00 MMTPA** coal from e-auction basket to meet their generation requirement.

2.0 The Seller agrees in principle, on best effort basis, to supply to the extent of **6.00 MMTPA** of all grades of coal as per Schedule-I from all dispatch points and by all modes of transport, from their e-auction basket for the period **from 1st April 2024 to 31st March 2025** for STPP to meet their generation requirement, as their coal requirement is not being met from linked sources.

3.0 The Purchaser agrees to pay the prices for supply of coal as per the price structure enclosed as **Annexure-1**. The notified basic prices of Power & Non-Power are as per SCCL price notification. The price structure enclosed at Annexure-1 would be subject to outcome of appeal against OP 13 of 2023 of TGERC (erstwhile TSERC) order dt. 01.04.2024 directing SCCL to desist

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from levying any premiums henceforth before the Hon'ble APTEL or any future appeal before Apex Court in the same matter as may be applicable.

4.0 The other charges like Surface Transport Charges, Fuel Surcharge, Pre-weigh Bin charges, Facility charges, Compensatory Yield charge etc., are applicable as on the date of dispatch of coal in addition to the above price as mentioned at point-3, as per the SCCL price notification.

5.0 Statutory duties and taxes like Royalty, Forest Permit Fee, Forest Land Adjustment, NMET, DMFT etc, are applicable as on the date of dispatch of coal in addition to the above price as mentioned at point-3 & 4, as per the SCCL price notification.

6.0 However, any other additional taxes and duties notified by Govt. agencies and SCCL respectively at the time of dispatch are applicable in addition to the above price as mentioned at point-3, 4, & 5, as per the SCCL price notification.

7.0 The Seller & Purchaser agrees for entering into Tripartite Agreement for Third Party Sampling at SCCL loading end for the coal supplied under MoU as per PFC guidelines. The credit or debit bill as the case may be shall be raised after the confirmation of the grade by TPSA.

8.0 For supply of coal to STPP either by Road, Rail & RCR mode of dispatches, the Seller shall issue Stock Transfer Order (STO) on the request from the Purchaser to the e-mail address of the Purchaser clearly indicating the dispatch points, quantity, grade, and destination as per the price components plus taxes and duties etc., (as mentioned at point Nos. 3, 4 , 5 & 6) applicable as on the date of issue of STO.

9.0 The existing practice / procedure for supply of coal through Rail / Road mode of coal transportation system from SCCL Mines/CHP/Washeries to STPP will be continued with JSP from the effective date of MOU till the commencement of TPS by TPSA as per the PFC guidelines. Further, after implementation of TPS by TPSA, if TPS is not conducted by TPSA for the reasons whatsoever, coal sampling will be done under joint sampling protocol. The detailed guidelines for JSP & TPS shall be as per **Schedule-II & Schedule-III.**

10.0 WEIGHMENT OF COAL:

10.1 Movement of coal by Indian Railway wagons:

In the case of dispatches by Rail, all the coal wagons loaded for Purchaser shall invariably be weighed at the Weigh-bridge of Seller and provided with an Electronic Print out of actual weight recorded. Both Purchaser and Seller shall have the right to witness the weighment of wagons at pre-weigh bins Weighbridges, if desired.

10.2 Procedure for weighment:

The following procedure shall be followed for weighment.

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a) Weighment at loading point shall be done on Electronic Weighbridge / pre-weigh bins of Seller and both Purchaser and Seller shall accept the Printout. In case of non-functioning or failure of electronic weighbridge / pre-weigh bins of Seller, both Purchaser and Seller shall accept belt weighment supported by electronic print out.

b) At the end of each calendar month, the Purchaser shall provide to the Seller the electronic printout of all the wagons / rakes weighed at STPP/JAIPUR end along with the correction factor worked out for each of the dispatch points.

c) In case of failure of electronic weighbridge or belt weigher of Seller, the weighment recorded by the Electronic weighbridge of Purchaser will be accepted by the Seller subject to submission of electronic printouts of each Wagon Weighed at Purchaser end. However, such electronic printouts will have to be supported by a correction factor arrived (on average) for the previous month. R Rs will be issued on sender's weight at Sellers end and reconciliation will be made subsequently with Purchaser's weighment records.

d) Where Electronic-weighing facility / pre-weigh bins is not functioning either at the Loading or at the Power House end, the existing system of accepting Sender's Weighment Acceptance (SWA) will continue to remain in force.

e) In case a few wagons in a rake are dispatched either unweighed or weighed but not supported by electronic printout {electronic weigh bridge or belt weigher), then only such wagons in that rake shall be treated as "Unweighed" at Loading point and shall be weighed at Unloading point and the weighment recorded at Unloading point will be accepted by the Seller subject to application of correction factors based on the variation noticed between weighment recorded at either end during the previous calendar months as detailed in clause 1.2.b.). Wherever Seller's print out shows "jumping" wagons not exceeding the first four continuous wagons or last four continuous wagons in a rake, as per the notification issued by railways from time to time is to be adopted and this is subject to a correction factor as per clause 5.2.b.) at Purchaser's end.

f) There shall be no over writing or manual entries in the Electronic printouts provided by Seller or Purchaser, as the case may be, in support of having the consignment weighed either at loading or unloading point. If electronic print outs at either end have overwriting / manual entries, the same shall not be accepted by either party and such wagons shall be treated as Unweighed and dealt as provided herein above.

g) **Calibration of Weighbridges / pre-weigh bins:**
The weighbridges both at Seller's end and at the Purchaser's end shall be calibrated in terms of the provisions of Weights & Measures Act. Both the Seller and Purchaser shall have the right to witness the calibration of the weighbridge at each other's end.

In case the Purchaser observes variation between the weight at Purchaser's end and at the Seller's end to an extent of more than 2% over and above the

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correction factor referred to in 1.2(b), continuously for a period of 15 days, the Seller and Purchaser shall get the weigh bridges installed at Loading and Unloading end re-calibrated within a period of 15 days from the date of notice of the Purchaser/Seller in terms of the provision of Weights & Measures Act.

10.3 **Movement of coal by Trucks through Road Mode:**
In the case of dispatches by Road, all the coal Trucks loaded for Purchaser shall invariably be weighed at the Weigh-bridge of Seller and provided with an Electronic Print out of actual weight recorded. Both Purchaser and Seller shall have the right to witness the weighment of Trucks at pre-weigh bins &Weighbridges, if desired. The existing practice or procedure is to be followed and agreed by both parties (Point No. 11 of MOU).

11.0 FACILITIES:

11.1 All necessary facilities such as required man-power, tools, tackles, transportation of samples, preparation room and office for the purpose of collection, carrying preparation, packing and preservation of samples will be provided by the Seller at whose end samples are being collected and the purchaser agrees to pay **Rs.5.00 per ton** for such facilities provided by the seller.

12.0 TOTAL MOISTURE CONTENT DETERMINATION:

12.1 The collection and preparation of total moisture samples shall be as per IS 436 (Part-I Sec-I, 1964) and the amendments thereof.

12.2 The total moisture from the rake-wise sample collected will be analyzed at the collection point laboratory as per procedure laid down in IS 436 (Part-I Sec-I, 1964) and the amendments thereof. The equilibrated moisture is determined in accordance with procedure as given in IS 1350 (Part I 1984 edition).

12.3 Wherever the sample is drawn by manual or semi mechanical methods, at the time of preparation of the sample so collected, a part of the sample shall be drawn from the crushed fraction around 12.5 mm size. The fraction so collected shall constitute the total moisture sample for such supplies.

12.4 If the surface moisture, of a coal sample on as received basis, (at loading end) exceeds its Equilibrated moisture, by 7% during the months from October to May and 9% during the months from June to September, (determined in accordance with the procedure as given in IS) pro-rata correction factor equivalent to the percentage by which the surface moisture exceeds the equilibrated moisture by 7% or 9% (as the case may be) shall be applied to the weights recorded by the weighment system and the same shall be final and acceptable for the purpose of billing and payment.

Ex: Equilibrated moisture of coal sample : 5.5%

Total moisture of the coal sample : 15.5%

Excess moisture : 15.5 – 5.5 = 10.%

Permissible excess moisture : 7.00 or 9.00%

Accountable excess surface moisture : 10.00 – (7.00 or 9.00) =3% or 1%

Prorata correction factor to be applied for that relative Wt = 3% or 1%

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13.0 METHOD OF BOOKING:

13.1 Title & Risk of Loss: Supply of coal shall be made by Seller at loading point on FOR Colliery Siding basis or FOB Purchaser Transport basis. The Seller warrants that coal delivered to the Purchaser as hereunder shall be good and marketable and its transport is lawful and that such coal shall be free and clear of any lien, claim demand, security, interest or any title risk to the coal purchased and sold as hereunder shall pass from Seller to Purchaser at the loading point. However, the Seller has the first lien and charge on the property of stores charged to the extent of dues from the Purchaser to the Seller.

13.2 BY RAILWAYS:

The Seller shall dispatch coal in full rake load to the Purchaser on freight-to-pay basis and will endeavor to comply with all documentation/formalities laid down by Railways for charging freight by Railways on Train Load rates basis only.

13.3 BY ROAD

The Seller and Purchaser shall mutually decide the road dispatch points for every quarter at least 15 days in advance and the coal will be supplied from such dispatch points. The Purchaser shall arrange to place the trucks to lift the coal from the agreed dispatch points. In case of any difficulty, the road dispatch points can be changed to other mutually agreed dispatch points. The Seller shall raise the invoices as per the quantity of coal dispatched by road. For all such road dispatches, the quality and the grade will be decided by collecting coal samples from those connected coal belts / bunkers on day-wise basis i.e., the supply made from one point once a day will be governed by one sample.

14.0 IDLE FREIGHT (FOR UNDER LOADING) & PENAL FREIGHT (OVER LOADING) CHARGES:

Wherever pre-weigh bin is in operation, both idle freight and penal freight charges will be borne by the Seller. Wherever pre-weigh bin is not installed, overloading charges are to be borne by the Purchaser and under loading charges are to be borne by the Seller.

14.1 PENAL FRIEGHT /OVERLOADING CHARGES FOR RAIL SUPPLIES

Any penal freight for overloading charged by the railway for any consignment shall be payable by purchaser. However, seller shall take all measures for loading the wagons as per the carrying capacity of wagon.

14.2 Incase seller fails to adjust the idle freight/under loading charges or/and penal freight/over loading charges in the regular bill, the purchaser is entitled to deduct these charges while settling the coal bills or from any other dues to the seller.

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15.0 BILLING AND PAYMENT:

15.1 The Seller shall raise Delivery Challan on rake-to-rake basis for coal supplied at the applicable price for the declared grade for the quantity as recorded in RRs. The Delivery Challan shall also include Surface Transport Charges, crushing Charges, High Capacity Loading Charges, all other Statutory Charges/ Levies and Sales tax, Excise duty etc.

15.2 Two sets of Delivery Challan prepared as above under Clause 6.1 shall be submitted to F&A department. A soft copy of all bills raised shall be given in bill form on spell wise basis

Following is the schedule of billing and payment:

Supply period	Date of presentation to designated officer
1st to 7th	12th
8th to 20th	22nd
21st to 30th / Month end	2nd of Next Month

15.3 In respect of unweighed consignments, the initial Billing shall be done as per above schedule on SWA basis as per practice in vogue in Railways.

15.4 In respect of unweighed consignments at the loading point and weighed at Purchaser's end, the Purchaser shall submit the electronic printout within 30 days of receipt of consignment at the unloading end. In case the Purchaser does not furnish weighment details of such consignments to the Seller within 30 days from the date of receipt, or consignments not having been weighed at both ends, the weight of the consignments shall be considered on SWA basis.

15.5 On receipt of reports for analysed grade, the Seller shall issue Debit/Credit notes to the Purchaser for Grade variation along with applicable taxes and duties etc., linking the Joint Sample analysis or referee sample analysis as the case may be. The schedule for submission of grade variation bills shall be as follows:

1Supply	Date of submission of Dr. & Cr. Notes STPP	Due date of adjustment/ payment BY STPP
1st to 7th	10th of subsequent month	Within 5 working days from the date of submission of Bills excluding the day of submission.
8th to 20th	22nd of subsequent month	-do-
21st to 30th/month end	2nd of the second subsequent month	-do-
1st to 30th/month end of Referee Samples	12th of second subsequent month	-do-

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15.6 Similarly Debit / Credit notes shall be issued by the Seller in respect of unweighed consignments at the loading point as per Clause No.6.4

15.7 Reconciliation of accounts will be made jointly by both the parties to the MOU on quarterly basis and completed latest by the end of second month of subsequent quarter in which supplies were made. For reconciliation of accounts, regular bills and Debit / Credit Notes issued by the Purchaser/Seller shall be considered to arrive at the amount refundable / payable.

16.0 SEGREGATION OF SHALE, STONES & FOREIGN / METALIC MATERIAL

a) Shale and stones of sizes of above 250 mm, and Foreign/Metallic Material shall be segregated by Purchaser, till the installation of auto samplers at the CHPs.

b) THE PURCHASER shall demarcate a site for stacking of Shale/stones segregated above 250 mm and also Foreign/Metallic Material (any two dimensions) and the same will be quantified. These may be intimated before the end of the following month to the Seller for inspection, if he so chooses, within 15 days.

c) Stones / shale / Foreign Metallic Material stacked at the demarcated site by the Purchaser shall be disposed off, by the Purchaser, on quarterly basis and actual weighment of trucks shall be jointly recorded by Purchaser and Seller. For this purpose the Purchaser shall intimate to the Seller the date of loading into the trucks and in case the Seller/his representative is not present, the actual weighment of the trucks will be recorded by the Purchaser.

d) THE PURCHASER shall lodge the claim for reimbursement of cost equivalent to the weighment of coal for the quantity of Stones & Shale/Foreign Metallic Material thus segregated.

e) Since THE PURCHASER, is receiving Coal mainly from THE SELLER the claim shall be proportionate to the Coal Receipts from THE SELLER.

f) The claim shall be worked out as follows: -

1) Basic price of equivalent quantity of coal, railway freight from colliery to TPS concerned, Surface Transportation charges.

2) THE PURCHASER claim shall not include statutory levies such as royalties, Stowing Excise Duty and any Sales Tax, if leviable on these statutory levies.

g) 100% of the claim of such stone / shale segregated as +250 mm size shall be reimbursed by THE SELLER as worked out above till the installation of automatic sampling system at the CHPs.

h) Claim shall be lodged by THE PURCHASER within 45 days from joint weighment of trucks and shall be certified for acceptance by THE SELLER and copy of the same shall be returned to THE PURCHASER within 30 days. The

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claim accepted for payment by THE SELLER will be given effect, while making payment of Coal sale bill of the last month of succeeding quarter. In other words, the claim against the quarter April-June shall be adjusted/settled in September and so on. In case of non-receipt of certification as above, THE PURCHASER shall have the right to recover the amount.

i) The claims lodged by THE PURCHASER shall be supported by the following documents:

j) 1) Total quantity of Shale & Stones/Foreign Metallic Material segregated from coal. This will be calculated on proportionate basis as mentioned in (e) above.

2) Copies of payment vouchers of payments made to Transport contractors for transportation of Shale & Stone from CHP to Dump yard. The arrangement will be reviewed every six months and difficulties, if any, will be mutually discussed and workable solutions arrived at.

17.0 FORCE MAJEURE:

DEFINITION -

"Force Majeure" shall mean any event or circumstance or combination of events or circumstances beyond the reasonable control of either Party (the Affected Party) and such event or circumstance cannot by an exercise of reasonable diligence be prevented or caused to be prevented, cannot despite the adoption of reasonable precautions and reasonable alternative measures (where sufficient time to adopt such precautions or alternative measures before the occurrence of such event or circumstance is available) be prevented, and which materially and adversely affects such party's performance of its duties or obligations under this Agreement.

i) Force Majeure circumstances and events shall include the following events to the extent that they or their consequences satisfy the above requirements;

A) The effect of any natural element or other act of God, including but not limited to any storm, flood, drought, lightning, earthquake, cyclone or other natural disaster.

B) Fire, accident, breakage of facilities or equipment, structural collapse or explosion attributable to a cause other than due to

1. Inherent defects of any equipment; or

2. Circumstances within the reasonable control of the Affected Party or its contractors;

C) Geological conditions that were not reasonably foreseeable Strikes

D) Epidemic, plague or quarantine:

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E) Any non-availability at the site of the Plant/Mine/Dispatch Point or otherwise, of all the equipment, facilities, materials or utilities as a consequence of Force Majeure event;

F) Air crash, shipwreck and train crash or failure or delays of transportation of equipment that was not reasonably foreseeable;

G) Acts of war (whether declared or undeclared), sabotage, terrorism or act of public enemy (including the acts of any independent unit or individual engaged in activities in furtherance of a programme of irregular warfare), riot, commotion or Q disorder except where solely restricted to employees of the Affected Party, mobilization, requisition, invasion, acts of belligerents or foreign enemies (whether declared or undeclared), blockades, embargoes, civil disturbance, revolution, rebellion or insurrection, exercise of military or usurped power, or any attempt at usurpation of power.

G) Radioactive contamination or ionizing, radiation from any nuclear fuel or from any nuclear waste from the combustion of nuclear fuel, radioactive toxic explosives or other hazardous properties of any explosive nuclear assembly or nuclear components thereof;

I) The enactment, promulgation, amendment, suspension or repeal of any Applicable laws after the date hereof;

J) Any delay or direction or order on the part of the Government of India or relevant State Government or denial or refusal to grant or renew, or any revocation, or modification of any required permit or mining lease or government approvals provided that such delay, modification, denial, refusal or revocation was not due to a cause attributable to the Affected Party.

K) Mine fires and inundation where either is due to natural causes despite normal precautions in accordance with extant mining practices in India, subsidence, eruption of gases and unforeseen geological disturbances;

L) Major breakdowns of units at Power Houses/Mines beyond the control of Purchaser/Seller.

M) Any event or circumstance of a nature analogous to the foregoing.

ii) **BURDEN OF PROOF**

In the event that the Parties are unable to agree in good faith that a Force Majeure event has occurred, the Parties shall resolve their dispute in accordance with the provisions of this Agreement. The burden of proof as to whether a Force Majeure event has occurred shall be upon the Party claiming the Force Majeure event.

iii) **EFFECT OF FORCE MAJEURE**

If either party is rendered wholly or partially unable to perform its obligations under this Agreement because of a Force Majeure event, that Party shall be

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excused from performance of the Agreement to the extent it is affected by the Force Majeure event provided.

A) The Affected Party within 5 (five) business days after the occurrence of the prevention, delay or hindrance in the performance of its obligations due to a Force Majeure event provides written notice to the other Party that such an event has occurred and, within 15 (fifteen) Business Days of the occurrence of such events further notice specifying the particulars of the occurrence, including an estimation of its expected duration and probable impact on the performance of its obligations hereunder provided that where the Affected Party has given notice after the expiry of the aforesaid period of 5 (five) Business Days, the Affected Party shall be excused from performance of the Agreement only from the date of the notice and not from the date of the occurrence of the Force Majeure event;

B) The Affected Party continues to furnish timely regular reports with respect thereto during the period of Force Majeure event;

C) The Affected Party shall use all reasonable efforts to continue to perform its obligations specified herein and to correct or cure the event or condition excusing performance as soon as possible;

D) The suspension of performance shall be of no greater scope and no longer duration than is reasonably necessitated by the Force Majeure event;

E) The Affected Party shall provide the other Party with prompt notice of the cessation of the Force Majeure event and shall promptly thereupon resume performance herein;

F) The non-performance of any obligation of either Party that was required to be completed prior to the occurrence of the Force Majeure event shall not be excused as a result of such subsequent Force Majeure event;

G) The occurrence of an event of Force Majeure shall not relieve either party of its obligations to make any payment hereunder for performance rendered prior to the occurrence of Force Majeure or for partial performance here under during periods of Force Majeure;

H) The Force Majeure event shall not relieve either Party of its obligation to comply with Applicable Laws;

I) Both Parties shall exercise all reasonable efforts to mitigate or limit damages to each other.

iv) SAVINGS

If the Seller is prevented from supplying coal due to a Force Majeure event affecting the Purchaser, the Seller shall be relieved of his obligation to supply coal. If Seller is prevented from supplying coal due to Force Majeure affecting the Seller, the Purchaser shall be relieved of its liability to accept coal for the duration of the relevant Force Majeure event.

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18 **ARBITRATION:**

In the event of any difference or dispute between the parties thereto, such dispute or difference shall be resolved amicably by mutual consultation or through the good offices of empowered agencies of the Government. If such resolution is not possible, then the unresolved dispute or difference shall be referred to an arbitrator to be appointed by each party to dispute and such appointed arbitrator will enter upon reference after appointment of umpire as per provisions of Arbitration Act.–This contract is subject to legal jurisdiction of courts at Hyderabad.

or

In case of any difference/disputes between the seller and the purchaser, the same shall be resolved amicably by mutual consultation. In case of such resolution is not possible, then the decision of the C&MD of SCCL shall be final.

19.0 **IMPLEMENTATION OF THE MOU:**

19.1 GM (E&M)/STPP shall be authorized to act for and on behalf of the Purchaser.

19.2 General Manager (Marketing) SCCL shall be authorized to act for and on behalf of the Seller.

19.3 Any other nomination of authorized representative shall be informed in writing by the Seller and Purchaser within one month of signing of this MOU or giving 30 (Thirty) days' notice.

19.4 It is expressly agreed that this MOU shall supersede all previous discussions and meetings held and correspondence exchanged between the Seller and the Purchaser in respect of this Agreement and any decisions arrived at therein in the past and before coming into force of this Agreement shall have no relevance with reference to this Agreement and no reference of such discussions of meetings or past correspondence shall be entertained either by the Seller or the Purchaser for interpreting this Agreement or its implementation.

20.0 **N O T I C E S.**

Any notice to be given under this Agreement shall be in writing and shall be deemed to have been duly and properly served upon the parties hereto if delivered against acknowledgement or by registered mail with acknowledgement duly addressed to the signatories or the authorized representative of the signatories at the addresses mentioned therein above,

21.0 **ASSIGNMENT:**

This MOU shall not be transferred or assigned in whole or in part by the Seller or the Purchaser to any person, Company, Firm or Organization without the prior written approval of Parties to the Agreement.

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22.0 **AMENDMENTS OR MODIFICATIONS:**

The MOU constitutes full and complete understanding between the parties. It shall supersede all previous correspondence the extent of inconsistency or repugnancy to the terms and conditions contained in this MOU. Only a written supplementary instrument assigned by the authorized representatives of both the parties shall effect any modification to this Agreement

23.0 This MoU will be effective from **1st April 2024** and can be amended/ supplemented or replaced by another document signed by the Parties.

IN WITNESS WHEREOF THE PARTIES THROUGH THEIR AUTHORISED REPRSENTATIVES HAVE SET THEIR HANDS ON THE DAY, MONTH AND YEAR FIRST ABOVE WRITTEN

For and on behalf of Seller
SCCL

(D.RAVI PRASAD)
GM (Marketing)
G.M. (Mktg.)
SCCL., Hyderabad

For and on behalf of Purchaser
STPP

(N.V.RAJASHEKAR RAO)
GM STPP
GENERAL MANAGER (E&M,
STPP, JAIPUR

Witness:

(P.SURENDER RAJU)
DGM (Marketing)

Witness: K. Venkataiah
SE(Elpm)/STPP.

Singareni Thermal Power Plant
SCCL
Jaipur-504 216. Dist: Mancherial

Annexure-1

PRICING STRUCTURE FOR STPP IN THE FY 2024-25

S. No	Type of customer	Mine	Quantity	*Price
1	Bridge Linkage	Normal	Up to 75 % Agreed Quantity	20 % over and above notified basic price of power for all grades of coal
		Cost Plus Mine/Blended CHP/Washery	Up to 75 % Agreed Quantity	Notified basic price of the Mine/Blended / CHP/ washed coal or 20% over and above notified basic price of the power whichever is higher
		Normal	Beyond 75 % Agreed Quantity	30% over and above notified basic price of Power Sector for all grades of coal.
		Cost Plus Mine/Blended CHP/Washery	Beyond 75 % Agreed Quantity	Notified basic price of the Mine/Blended CHP / washed coal or 30% over and above notified basic price of the power whichever is higher
2	Non - Bridge Linkage /MOU customer	Normal	Upto MOU Quantity	30 % over and above notified basic price of power for all grades of coal
		Cost Plus Mine/Blended CHP/Washery	Upto MOU Quantity	Notified basic price of the Mine/Blended CHP / washed coal or 30% over and above notified basic price of the power whichever is higher

***This MoU price would be subject to outcome of appeal against OP 13 of 2023 of TGERC (erstwhile TSERC) order dt. 01.04.2024 directing SCCL to desist from levying any premiums henceforth before the Hon'ble APTEL or any future appeal before Apex Court in the same matter as may be applicable.**

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SCHEDULE - I

THE SPECIFICATIONS FOR QUALITY OF COAL

The Quality (grade) of coal will be specified as follows:

Size of coal: coal size is specified as (-) 250 mm.

Grade	GCV Range - K.Cal/Kg.
G1	Above 7000
G2	6701 to 7000
G3	6401 to 6700
G4	6101 to 6400
G5	5801 to 6100
G6	5501 to 5800
G7	5201 to 5500
G8	4901 to 5200
G9	4601 to 4900
G10	4301 to 4600
G11	4001 to 4300
G12	3701 to 4000
G13	3401 to 3700
G14	3101 to 3400
G15	2801 to 3100
G16	2501 to 2800
G17	2201 to 2500

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SCHEDULE - II

PROCEDURE FOR JOINT SAMPLING AND ANALYSIS OF COAL FOR ASSESSMENT OF GRADE:

This procedure for joint sampling and analysis of coal will form part of the MOU between M/s The Singareni Collieries Company Limited and M/s. STPP

Procedure for Joint sampling

1 **Collection of samples from the Railway Siding I Coal Handling Plants**

(a) In case of dispatch by rail each rake of Coal supplied to the Purchaser from the Delivery Point shall be considered as a lot for the purpose of sampling.

(b) Samples shall be collected from the belt conveyor at the time of loading into rakes. In case where automatic samplers are installed, samples shall be collected from automatic samplers. In case of where there is no belt conveyor, the samples shall be collected from the coal yard at the siding while loading from loading area. Sampling procedure shall be as per BIS norms.

2 **Collection of Samples of Coal Dispatches by Road**

(a) The sampling and analysis of coal will be done Delivery Point wise / Grade-wise in case of Road / RCR mode for the day. The result of the samples will be applied to all the customers supplied coal on that day for the grade supplied.

(b) The first truck for sampling on a day shall be selected randomly from the first eight trucks. Every 8th (eighth) such truck thereafter shall be subjected to sampling. In the event that there are less than 8 (eight) trucks loaded on any particular day, then only 1 (one) sample shall be selected randomly from amongst loaded truck/ trucks.

(c) The spot at the top of the truck will be leveled and at least 25 cm of Coal surface shall be removed/scrapped from the top and the place will be leveled for an area of 50 cm by 50 cm far collection of sample.

(d) About 30 kg of the sample shall be collected from each truck by drawing 6 increments of approx. 5 kg each with the help of shovel/scoop.

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(e) All the samples collected from the selected trucks in accordance with paragraph 2(b) above shall be mixed together to form a gross sample of the day.

3) **Procedure for Sample Preparation:**

3.1. The gross sample jointly collected at the Delivery Point shall be divided into two portions. One portion (one fourth of the gross sample) called Part-1 will be used for analysis of total moisture and the other portion (three fourth of the gross sample) called Part-2 will be used for determination of ash, moisture and GCV on equilibrated basis.

3.2. The Part-2 samples shall be reduced into a laboratory sample of 212 microns on the date immediately following the date of collection as per BIS Standards (IS: 436 (Part I/Section I) - 1964).

3.3. The sample collected is subjected to primary crushing to reduce the size to 12 mm. After crushing the entire sample, it is thoroughly mixed, coned and quartered to reduce the initial quantity to1/4th. The sample so obtained shall be further subjected to secondary crushing to reduce the sample size to 3 mm. After the second stage crushing the entire sample is properly mixed, coned and quartered repeatedly to reduce the quantity to 2 Kg.

3.4. All the above 2.0 Kg of sample 3 mm size obtained either manual or mechanical sampling shall be pulverized in a pre- cleaned hammer type of pulveriser to 212 micron size by repeated sieving using BIS:75 Sieve and pulverizing. The pulveriser is opened all the sample is collected and it is thoroughly mixed.

3.5. The final pulverized sample will be divided into three parts, viz. Set — I, Set — II and Set-III as follows:

(a) Set-1 of the sample shall be handed over to the MOU customer for analysis at jointly

(b) Set-II of the sample shall be analysed at SCCL laboratory.

(c) Set-III of the sample called referee sample shall be sealed jointly

3.6 **Procedure for packing of the Laboratory sample:**

The 212 micron size sample is transferred into a clean transparent polyethylene bag. Each sample bag shall be properly labeled, both outside and inside having the details of source, date of sampling, signatures & names of the representatives of SCCL & the Customer. Signatures shall serve the purpose of identification while testing at unloading end and also while testing the referee samples, if needed. The free space of the packet shall be multifold

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horizontally and stapled / sealed. The polyethylene bag shall be enclosed in another paper bag / cloth bag stapled / tied with another label having the same details. The bag with label shall be tied covering all its four sides with a cotton thread, it is waxed at the junction of 2 threads on one side and the knot on the other side and jointly seals are applied on the wax before solidification to make the sample packed pilfer proof. The joint sealing of the referee sample is done in such a way that tampering in any manner is not possible without disturbing the seal.

4 ANALYSIS AND RECONCILIATION OF RESULTS:

4.1 Final laboratory sample will be analyzed independently by Seller and Purchaser on equilibrated basis at 40° C and 60% RH, as per procedure laid down in IS 1350(Part-I) and IS 1350(Part-2) and any amendment thereof.

4.2. Analysis results of the joint samples of Fifteen (15) days shall be exchanged under sealed cover before the last date for such exchange as given below. These results shall be jointly reconciled amongst the authorized representatives of the Seller and Purchaser within the date as per the schedule given below:

Rake samples/Road samples collected between	Date of exchange of results of analysis	Date for analysis of referee samples by seller/Purchaser
1st to 15th	22nd of the current month	On or before of 16th of the subsequent month/immediate next working day, as agreed mutually
16th to the last day of the month(i.e. 28th or 29th in Feb, 30 or 31st in the rest of the months, as per the case	7th of subsequent month	

4.3 In the event the results of analysis reports of Seller and Purchaser indicate a variation in grade, such disputed referee samples of the month shall be analyzed at the respective Regional Labs of the seller or the purchaser in alternate months. Such joint analysis results shall be binding both on the Seller and the Purchaser, provided further that in the event of either party failing to submit the results on appointed day or time or venue as per 4.2 above for reconciliation, the analysis results of the other party would be deemed to be final and no referee sample analysis for such cases shall be undertaken.

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SCHEDULE – III

PROCEDURE FOR THIRD PARTY SAMPLING AND ANALYSIS OF COAL FOR ASSESSMENT OF GRADE & MOISTURE.

The procedure for Third Party Sampling shall be as per the Tripartite Agreement to be signed by SCCL, STPP & TPS Agency as per PFC guidelines.

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THE SINGARENI COLLIERIES COMPANY LIMITED

(A Government Company)

REGIONAL ANALYTICAL LABORATORY, RAMAMGUNDAM AREA -I

Ref: SCCL/RG-1/RAL/20204/12/

Date: :05-07-2024

EXCHANGE OF JOINT COAL SAMPLES ANALYSIS RESULTS WITH STPP FROM 01.05.2024 TO 31.05.2024

GDK 6 CHP TO M/s. SINGARENI THERMAL POWER PLANT (JAIPUR)

Sl. No.	Particulars	Date of Loading	R.R.NO.	Quantity (T)	Decl.Gr.	SCCL RESULTS				STPP RESULTS				Final Grade	Total Moist %	Excess Mois%
						Moi%	Ash%	GCV K.Cal/Kg	Gr	Moi%	Ash%	GCV K.Cal/Kg	Gr			
1	GDK 6 CHPSTPP/SCCL/05/24/01	02.05.2024	461004482	3,644.65	G13-CRR	5.04	44.60	3495	G13	5.89	45.82	3405	G13	**G13**	9.64	Nil
2	GDK 6 CHPSTPP/SCCL/05/24/02	03.05.2024	461004483	3,518.22	G13-CRR	4.97	45.76	3414	G13	5.74	46.13	3422	G13	**G13**	9.95	Nil
3	GDK 6 CHPSTPP/SCCL/05/24/03	09.05.2024	461004497	3,518.68	G13-CRR	5.02	44.93	3473	G13	5.65	46.68	3405	G13	**G13**	10.12	Nil
4	GDK 6 CHPSTPP/SCCL/05/24/04	25.05.2024	461004524	3,710.97	G13-CRR	4.91	46.82	3325	G14	5.88	47.67	3231	G14	**G14**	10.58	Nil
5	GDK 6 CHPSTPP/SCCL/05/24/05	29.05.2024	451000084	3,431.30	G13-CRR	5.01	45.11	3456	G13	6.02	45.78	3407	G13	**G13**	10.37	Nil
				17,823.82												

1 No. of samples exchanged : 5
2 Disputed samples : 0
3 Agreed samples 'G12' grade : 0
4 Agreed samples 'G13' grade : 4
5 Agreed samples 'G14' grade : 1

Supdt(Analytical),STPP

Jr.Scientific Officer,Regional Laboratory,RGM

DGM (Coal),STPP

Addl.MGR (QM), RG-2

THE SINGARENI COLLIERIES COMPANY LIMITED

(A Government Company)

QUALITY MANAGEMENT DEPT, RAMAMGUNDAM AREA -1

(45)

SCCL/RG-1/RAL/2024/12/

Date: 05-07-2024

EXCHANGE OF JOINT COAL SAMPLES ANALYSIS RESULTS WITH STPP FROM 01.05.2024 TO 31.05.2024

GDK-1 CSP TO M/s. SINGARENI THERMAL POWER PLANT (JAIPUR)

DECLARED GRADE: " G8 - CRR "

Sl. No.	Particulars	Date of Loading	R.R.NO.	Quantity (T)	Decl.Gr.	SCCL RESULTS				STPP RESULTS				Final Grade	Total Moist %	Excess Mois%
						Moi%	Ash%	GCV K.Cal/Kg	Gr	Moi%	Ash%	GCV K.Cal/Kg	Gr			
1	GDK1CSP/STPP/05/2024/01	24.05.2024	451000035	G8-CRR	3,758.88	5.04	31.52	4625	G9	5.58	33.94	4610	G9	G9	10.24	Nil

1 No. of samples exchanged : 1
2 Disputed samples : 0
3 Agreed samples 'G7' grade : 0
4 Agreed samples 'G8' grade : 0
5 Agreed samples 'G9' grade : 1
6 Agreed samples 'G10' grade 0

L.J.V. SLL.

Supdt(Analytical),STPP

Jr.Scientific Officer,Regional Laboratory,RGM

Dy.GM(Coal),STPP

DGM (QM), RG-1

(46)

THE SINGARENI COLLIERIES COMPANY LIMITED

(A Government Company)

2X600 MW, SINGARENI THERMAL POWER PROJECT,

JAIPUR (V&m), PIN: 504216, Adilabad District, Telangana state.

Ref.No. STPP/O&M/24/09/ 685 A Date 23/7/24.

Scientific Officer
Regional Lab, Godavarikhani

Sub:- STPP-GDK OC6 JSP Coal Samples Analysis Reports 01-June-2024 to 30-June-2024

S.No.	Date	RR No./ FNR No	Rake No.	Quantity (Tones)	RH %	ASH%	VM%	FC%	GCV (K.Cal /Kg)	Gr.
1	2-Jun-24	461004535	GDK/STPP/SCCL/06/24/01	3722.80	5.89	45.56	23.49	25.07	3354	G14
2	7-Jun-24	461004543	GDK/STPP/SCCL/06/24/02	3626.07	6.21	44.20	24.30	25.29	3420	G13
3	15-Jun-24	461004554	GDK/STPP/SCCL/06/24/03	3385.08	5.94	45.02	24.08	24.95	3426	G13
4	18-Jun-24	461004560	GDK/STPP/SCCL/06/24/04	3599.82	5.74	44.35	24.86	25.05	3420	G13
				14333.77	5.95	44.79	24.18	25.09	3404	G13

L.J.V.
SUPDT.(Analytical)
2X600 MW,STPP

Chief O&M)
2X600 MW,STPP

(47)

THE SINGARENI COLLIERIES COMPANY LIMITED

(A Government Company)

2X600 MW, SINGARENI THERMAL POWER PROJECT,

JAIPUR (V&m), PIN: 504216, Adilabad District, Telangana state.

Ref.No. STPP/O&M/24/09/ Date 23/7/24.

Scientific Officer
Regional Lab, Godavarikhani

Sub:- STPP-GDK OC3 JSP Coal Samples Analysis Reports 01-June-2024 to 30-June-2024

S.No.	Date	RR No./ FNR No	Rake No.	Quantity (Tones)	RH %	ASH%	VM%	FC%	GCV (K.Cal /Kg)	Gr.
1	1-Jun-24	461004534	GDK/STPP/SCCL/06/24/01	3843.88	6.02	38.83	25.23	29.91	4010	G11
2	2-Jun-24	461004536	GDK/STPP/SCCL/06/24/02	3837.08	6.05	41.86	24.26	27.83	3713	G12
3	3-Jun-24	461004537	GDK/STPP/SCCL/06/24/03	3849.04	5.90	38.25	28.71	27.14	4028	G11
4	8-Jun-24	461004546	GDK/STPP/SCCL/06/24/04	3823.54	6.10	38.05	26.27	29.58	4006	G11
5	10-Jun-24	461004547	GDK/STPP/SCCL/06/24/05	3849.70	5.88	41.73	25.56	26.83	3736	G12
6	13-Jun-24	461004552	GDK/STPP/SCCL/06/24/06	3779.36	5.87	40.10	25.29	28.74	4006	G11
7	15-Jun-24	461004553	GDK/STPP/SCCL/06/24/07	3849.78	5.91	39.34	26.10	28.65	4017	G11
8	15-Jun-24	461004555	GDK/STPP/SCCL/06/24/08	3788.64	5.94	38.95	25.39	29.72	4027	G11
9	16-Jun-24	461004557	GDK/STPP/SCCL/06/24/09	3827.26	6.10	41.77	24.05	28.08	3724	G12
10	16-Jun-24	461004558	GDK/STPP/SCCL/06/24/10	3717.66	5.87	38.99	25.04	30.09	4004	G11
11	23-Jun-24	461004563	GDK/STPP/SCCL/06/24/11	3760.32	5.99	41.71	25.74	26.56	3722	G12
12	30-Jun-24	461004570	GDK/STPP/SCCL/06/24/12	3826.46	5.89	42.06	24.75	27.29	3732	G12
				45752.72	5.96	40.14	25.54	28.37	3894	G12

L.J.V.

SUPDT.(Analytical)
2X600 MW,STPP

Chief O&M)
2X600 MW,STPP

THE SINGARENI COLLIERIES COMPANY LIMITED
(A Government Company)
REGIONAL ANALYTICAL LABORATORY MANDAMARRI

Ref: MMR/RAL/Q/25/ 301

Date: 29.03.2025

DISPUTED JOINT COAL SAMPLES ANALYSIS REPORT PERTAINING TO STPP/JAIPUR & SRP OCP(SRIRAMPUR) FOR THE MONTH OF FEBRUARY-2025

DECLARED GRADE: " G8- CRR "

Sl. No.	Particulars	SAP Sample NO	Date of Loading	RR.NO	Quantity (T)	SCCL RESULTS				STPP RESULTS				FINAL RESULTS			
						Moi%	Ash%	GCV K.Cal/Kg	Gr	Moi%	Ash%	GCV K.Cal/Kg	Gr	Moi%	Ash%	GCV K.Cal/Kg	Gr
1	SRP-OCP SIDING/2/25/357-G8	92002	09.02.25	461003054	3848.14	5.60	27.11	5074	G8	6.02	35.96	4265	G11	5.36	36.10	4296	G11
2	SRP/OCP/STPP/02/25/378-G8	92897	16.02.25	441000283	3844.55	6.52	26.18	5030	G8	6.12	33.34	4434	G10	5.89	33.61	4581	G10
3	SRP/OCP/STPP/02/25/379-G8	92899	17.02.25	461003075	3844.78	6.45	28.06	4989	G8	6.18	31.61	4610	G9	6.10	28.21	4992	G8
4	SRP/OCP/STPP/02/25/380-G8	92900	17.02.25	461003076	3831.70	6.44	27.93	5001	G8	6.21	31.65	4608	G9	6.14	27.40	5022	G8
5	SRP/OCP/STPP/02/25/384-G8	92904	19.02.25	461003079	3839.22	6.48	28.02	4986	G8	6.18	32.04	4614	G9	6.08	28.43	4973	G8
6	SRP/OCP/STPP/02/25/390-G8	92911	21.02.25	461003084	3782.04	6.43	27.71	5006	G8	6.14	37.98	4094	G11	5.40	35.84	4275	G11
7	SRP/OCP/STPP/02/25/392-G8	92912	22.02.25	461003086	3784.12	6.40	27.84	5027	G8	6.19	37.26	4122	G11	6.05	37.11	4253	G11
8	SRP/OCP/STPP/02/25/396-G8	92922	24.02.25	461003092	3783.96	6.28	27.64	5010	G8	6.16	35.29	4321	G10	6.10	27.77	5035	G8
9	SRP/OCP/STPP/02/25/401-G8	93156	27.02.25	461003097	3773.64	6.45	27.92	5006	G8	6.22	34.72	4302	G10	5.97	28.06	4988	G8

Dy.GM(Coal Quality)
STPP

Supdt.(AS)
STPP

Addl. Manager(QM)
Incharge
Srirampur Area

Jr.Scientific Officer,
Reg. Analytical Lab MM

THE SINGARENI COLLIERIES COMPANY LIMITED
(A Government Company)
REGIONAL ANALYTICAL LABORATORY MANDAMARRI

Ref: MMR/RAL/Q/25/ 298

Date: 29.03.2025

DISPUTED JOINT COAL SAMPLES ANALYSIS REPORT PERTAINING TO STPP/JAIPUR & SRP CHP(SRIRAMPUR) FOR THE MONTH OF FEBRUARY-2025

DECLARED GRADE: " G10 - CRR "

Sl. No.	Particulars	SAP Sample NO	Date of Loading	RR.NO	Quantity (T)	SCCL RESULTS				STPP RESULTS				FINAL RESULTS			
						Moi%	Ash%	GCV K.Cal/Kg	Gr	Moi%	Ash%	GCV K.Cal/Kg	Gr	Moi%	Ash%	GCV K.Cal/Kg	Gr
1	SRP-CHP/STPP/2/25/320	91425	03.02.25	461002783	3838.24	5.55	36.23	4348	G10	5.72	43.71	3510	G13	5.69	44.61	3506	G13
2	SRP-CHP/STPP/2/25/321	91426	03.02.25	461002784	3838.74	5.54	36.37	4338	G10	5.7	41.23	3758	G12	5.55	39.94	3889	G12
3	SRP-CHP/STPP/2/25/322	91427	04.02.25	461002785	3838.78	5.56	36.12	4352	G10	5.68	36.08	4272	G11	5.69	36.02	4369	G10
4	SRP-CHP/STPP/2/25/323	91491	05.02.25	461002787	3836.36	5.59	35.73	4389	G10	5.65	38.01	4084	G11	5.71	35.89	4375	G10
5	SRP-CHP/STPP/2/25/325	91523	06.02.25	461002790	3844.36	5.62	35.17	4402	G10	5.62	40.62	3820	G12	5.36	40.20	3859	G12
6	SRP-CHP/STPP/2/25/327	91556	07.02.25	461002792	3845.24	5.52	36.31	4339	G10	5.65	43.44	3552	G13	4.89	45.21	3541	G13
7	SRP-CHP/STPP/2/25/328	91626	08.02.25	461002793	3844.96	5.53	36.64	4328	G10	5.67	43.11	3561	G13	4.96	46.09	3487	G13
8	SRP-CHP/STPP/2/25/329	91629	08.02.25	461002794	3839.42	5.55	36.39	4335	G10	5.68	40.72	3828	G12	5.66	35.59	4377	G10
9	SRP-CHP/STPP/2/25/330	91665	09.02.25	461002795	3838.64	5.63	35.42	4397	G10	5.7	40.44	3845	G12	5.59	36.40	4354	G10
10	SRP/CHP/STPP/02/25/333	91952	10.02.25	461002798	3838.00	5.59	35.48	4411	G10	5.68	42.59	3632	G13	5.06	46.29	3480	G13
11	SRP/CHP/STPP/02/25/334	91953	11.02.25	461002799	3839.98	5.61	35.12	4333	G10	5.66	44.97	3444	G13	5.16	45.11	3529	G13
12	SRP/CHP/STPP/02/25/335	91956	12.02.25	461002800	3838.72	5.52	36.15	4370	G10	5.67	35.85	4286	G11	6.03	36.20	4390	G10
13	SRP/CHP/STPP/02/25/340	92205	14.02.25	461002804	3781.36	6.18	35.17	4354	G10	5.65	41.69	3767	G12	5.75	35.74	4388	G10
14	SRP/CHP/STPP/02/25/341	92209	15.02.25	461002807	3821.92	6.13	35.88	4327	G10	5.76	44.93	3423	G13	5.52	43.33	3666	G13
15	SRP/CHP/STPP/02/25/342	92214	16.02.25	461002808	3824.22	6.18	35.52	4335	G10	5.78	39.06	3978	G12	5.69	35.15	4395	G10
16	SRP/CHP/STPP/02/25/346	92325	18.02.25	461002813	3340.14	6.13	35.50	4351	G10	5.8	44.37	3495	G13	5.74	44.22	3584	G13
17	SRP/CHP/STPP/02/25/348	92454	20.02.25	461002817	3827.16	6.19	35.20	4349	G10	5.76	45.06	3435	G13	5.49	42.67	3649	G13
18	SRP/CHP/STPP/02/25/349	92512	20.02.25	461002818	3906.42	6.10	35.87	4338	G10	5.68	35.55	4299	G11	5.68	35.35	4419	G10
19	SRP/CHP/STPP/02/25/352	92543	22.02.25	461002821	3911.42	6.15	35.72	4328	G10	5.63	38.06	4097	G11	5.77	35.32	4398	G10
20	SRP/CHP/STPP/02/25/354	92630	23.02.25	461002824	3776.22	6.25	34.91	4370	G10	5.64	35.50	4297	G11	5.75	35.70	4364	G10
21	SRP/CHP/STPP/02/25/358	92802	25.02.25	461002829	3839.80	6.26	35.34	4328	G10	5.65	38.52	4028	G11	5.71	36.71	4337	G10
22	SRP/CHP/STPP/02/25/359	92803	25.02.25	461002830	3844.76	6.29	35.27	4337	G10	5.66	35.74	4279	G11	5.64	35.93	4358	G10
23	SRP/CHP/STPP/02/25/360	92926	26.02.25	461002832	3836.36	6.33	35.33	4334	G10	5.67	41.66	3775	G12	5.64	35.99	4347	G10
24	SRP/CHP/STPP/02/25/361	92932	27.02.25	461002834	3841.74	6.30	35.43	4322	G10	5.69	37.68	4171	G11	5.59	35.69	4392	G10

Dy.GM(Coal Quality)
STPP

Supdt (AS)
STPP

Addl. Manager(QM)
SRPArea
Incharge (QM)
Srirampur Area

Jr.Scientific Officer
Reg. Analytical Lab MM

49

(30)

THE SINGARENI COLLIERIES COMPANY LIMITED
(A Government Company)
REGIONAL ANALYTICAL LABORATORY MANDAMARRI

Ref: MMR/RAL/Q/25/ 295

Date: 28.03.2025

STPP JOINT COAL SAMPLES ANALYSIS RESULTS EXCHANGE FOR THE PERIOD FROM 01.02.25 TO 28.02.2025

SRPCHP(IK OCP-3494) TO M/s. SINGARENI THERMAL POWER PLANT (JAIPUR) **DECLARED GRADE: " G8 - CRR "**

Sl. No.	Particulars	SAP Sample No.	Date of Loading	RR.NO	Quantity (T)	SCCL RESULTS				STPP RESULTS				Final	Total
						Mol%	Ash%	GCV K.Cal/Kg	Gr	Mol%	Ash%	GCV K.Cal/Kg	Gr	Grade	Moist %
1	SRP/CHP/IKOCP/STPP/02/25/72	92218	17.02.25	461002811	3838.46	6.20	28.57	4931	G8	5.61	32.00	4645	G9	Disp	10.11
2	SRP/CHP/IKOCP/STPP/02/25/73	92801	24.02.25	461002828	3839.32	6.50	27.51	5016	G8	5.59	34.23	4435	G10	Disp	9.73
3	SRP/CHP/IKOCP/STPP/02/25/74	92925	26.02.25	461002831	3781.96	6.41	28.15	4984	G8	6.00	29.54	4909	G8	G8	10.14
4	SRP/CHP/IKOCP/STPP/02/25/75	92927	26.02.25	461002833	3780.84	6.34	27.76	5032	G8	6.26	36.17	4173	G11	Disp	9.64
5	SRP/CHP/IKOCP/STPP/02/25/76	92987	27.02.25	461002836	3775.94	6.31	27.91	5020	G8	6.25	28.97	4876	G9	Disp	9.80
6	SRP/CHP/IKOCP/STPP/02/25/77	93045	28.02.25	461002838	3777.00	6.29	28.58	4968	G8	6.20	28.90	4904	G8	G8	9.94

1 No. of samples exchanged : 6 (Six only)
2 Disputed samples : 4 (Four only)
3 Agreed samples 'G8' grade : 2 (Two only)
4 Agreed samples 'G9' grade : 0 (Zero)
5 Agreed samples 'G10' grade : 0 (Zero)
6 Agreed samples 'G11' grade : 0 (Zero)
7 Agreed samples 'G12' grade : 0 (Zero)

Dy.GM(Coal Quality)
STPP

Supdt.(AS)
STPP

Addl. Manager(QM)
SRP Area
Incharge (QM)
Srirampur Area

Jr.Scientific Officer,
Reg. Analytical Lab MM

(51)

THE SINGARENI COLLIERIES COMPANY LIMITED
(A Government Company)
REGIONAL ANALYTICAL LABORATORY MANDAMARRI

Ref: MMR/RAL/Q/25/294

Date: 28.03.2025

STPP JOINT COAL SAMPLES ANALYSIS RESULTS EXCHANGE FOR THE PERIOD FROM 01.02.25 TO 28.02.2025

SRPCHP(IK OCP-3494) TO M/s. SINGARENI THERMAL POWER PLANT (JAIPUR)

DECLARED GRADE: " G10 - CRR "

Sl. No.	Particulars	SAP Sample No.	Date of Loading	RR.NO	Quantity (T)	SCCL RESULTS				STPP RESULTS				Final Grade	Total Moist %
						Mol%	Ash%	GCV K.Cal/Kg	Gr	Mol%	Ash%	GCV K.Cal/Kg	Gr		
1	SRP/CHP/IKOCP/STPP/02/25/71	91258	02.02.25	461002782	3838.92	5.69	34.33	4473	G10	5.61	36.86	4276	G11	Disp	9.72

1 No. of samples exchanged : 1 (One only)
2 Disputed samples : 1 (One only)
3 Agreed samples 'G10' grade : 0 (Zero)
4 Agreed samples 'G11' grade : 0 (Zero)
5 Agreed samples 'G12' grade : 0 (Zero)

Dy.GM(Coal Quality)
STPP

I.J.V.
Supdt.(AS)
STPP

Addl. Manager(QM)
SRP Area
Srirampur Area

Jr.Scientific Officer,
Reg. Analytical Lab MM

(52)

THE SINGARENI COLLIERIES COMPANY LIMITED

(A Government Company)

REGIONAL ANALYTICAL LABORATORY MANDAMARRI

Ref: MMR/RAL/Q/25/293

Date: 28.03.2025

STPP JOINT COAL SAMPLES ANALYSIS RESULTS EXCHANGE FOR THE PERIOD FROM 01.02.25 TO 28.02.2025

SRP OCP TO M/s. SINGARENI THERMAL POWER PLANT (JAIPUR)

DECLARED GRADE: " G8 - CRR "

Sl. No.	Particulars	SAP Sample NO	Date of Loading	RR.NO	Quantity (T)	SCCL RESULTS				STPP RESULTS				Final Grade	Total Moist %
						Moi%	Ash%	GCV K.Cal/Kg	Gr	Moi%	Ash%	GCV K.Cal/Kg	Gr		
1	SRP-OCP SIDING/2/25/357-G8	92002	09.02.25	461003054	3848.14	5.60	27.11	5074	G8	6.02	35.96	4265	G11	Disp	9.99
2	SRP/OCP/STPP/02/25/372-G8	92065	14.02.25	461003069	3854.3	6.45	26.74	4994	G8	6.08	29.20	4912	G8	G8	9.90
3	SRP/OCP/STPP/02/25/378-G8	92897	16.02.25	441000283	3844.55	6.52	26.18	5030	G8	6.12	33.34	4434	G10	Disp	9.95
4	SRP/OCP/STPP/02/25/379-G8	92899	17.02.25	461003075	3844.78	6.45	28.06	4989	G8	6.18	31.61	4610	G9	Disp	9.82
5	SRP/OCP/STPP/02/25/380-G8	92900	17.02.25	461003076	3831.70	6.44	27.93	5001	G8	6.21	31.65	4608	G9	Disp	10.16
6	SRP/OCP/STPP/02/25/381-G8	92901	18.02.25	441000284	3834.48	6.35	28.60	4952	G8	6.20	28.40	4904	G8	G8	9.99
7	SRP/OCP/STPP/02/25/382-G8	92902	18.02.25	461003077	3830.30	6.47	28.15	4976	G8	6.23	29.00	4903	G8	G8	10.05
8	SRP/OCP/STPP/02/25/383-G8	92903	18.02.25	461003078	3911.22	6.42	28.31	4958	G8	6.15	28.29	4902	G8	G8	9.65
9	SRP/OCP/STPP/02/25/384-G8	92904	19.02.25	461003079	3839.22	6.48	28.02	4986	G8	6.18	32.04	4614	G9	Disp	9.85
10	SRP/OCP/STPP/02/25/390-G8	92911	21.02.25	461003084	3782.04	6.43	27.71	5006	G8	6.14	37.98	4094	G11	Disp	9.79
11	SRP/OCP/STPP/02/25/392-G8	92912	22.02.25	461003086	3784.12	6.40	27.84	5027	G8	6.19	37.26	4122	G11	Disp	9.79
12	SRP/OCP/STPP/02/25/394-G8	92918	23.02.25	461003090	3857.64	6.38	26.72	5021	G8	6.12	29.31	4908	G8	G8	9.83
13	SRP/OCP/STPP/02/25/396-G8	92922	24.02.25	461003092	3783.96	6.28	27.64	5010	G8	6.16	35.29	4321	G10	Disp	9.92
14	SRP/OCP/STPP/02/25/401-G8	93156	27.02.25	461003097	3773.64	6.45	27.92	5006	G8	6.22	34.72	4302	G10	Disp	9.97

1	No. of samples exchanged :	14 (Fourteen only)
2	Disputed samples :	9 (Nine only)
3	Agreed samples 'G8' grade :	5 (Five only)
4	Agreed samples 'G9' grade :	0 (Zero)
5	Agreed samples 'G10' grade :	0 (Zero)
6	Agreed samples 'G11' grade :	0 (Zero)
7	Agreed samples 'G12' grade :	0 (Zero)

Dy.GM(Coal Quality)
STPP

Supdt.(AS)
STPP

Addl. Manager (QM)
Sri SRP Area

Jr.Scientific Officer,
Reg. Analytical Lab MM

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THE SINGARENI COLLIERIES COMPANY LIMITED
(A Government Company)
REGIONAL ANALYTICAL LABORATORY MANDAMARRI

Ref: MMR/RAL/Q/25/302

Date: 28-03-25

STPP JOINT COAL SAMPLES ANALYSIS RESULTS EXCHANGE FOR THE PERIOD FROM 01.02.2025 TO 28.02.2025

BPA GOLETI CHP TO M/s. SINGARENI THERMAL POWER PLANT (JAIPUR)

DECLARED GRADE: " G13 - CRR "

Sl. No.	Particulars	SAP Sample NO	Date of Loading	RR.NO	Quantity (T)	SCCL RESULTS				STPP RESULTS				Final Grade	Total Moist %
						Mol%	Ash%	GCV K.Cal/Kg	Gr	Mol%	Ash%	GCV K.Cal/Kg	Gr		
1	BPA/GLT/STPP/02/25/01 G-13	91319	01.02.25	461001323	3777.36	10.50	35.85	3463	G13	8.68	40.51	3565	G13	G13	15.80

1 No. of samples exchanged : 1 (One only)
2 Disputed samples -: 0 (Zero)
3 Agreed samples 'G11' grade : 0 (Zero)
4 Agreed samples 'G12' grade : 0 (Zero)
4 Agreed samples 'G13' grade : 1 (One only)

Dy.GM(Coal Quality)
STPP

Supdt.(AS)
STPP

Incharge(Quality)
BPA Area

Jr.Scientific Officer,
Reg. Analytical Lab MM

THE SINGARENI COLLIERIES COMPANY LIMITED
(A Government Company)
REGIONAL ANALYTICAL LABORATORY MANDAMARRI

MMR/RAL/Q/25/300

Date: 29.03.2025

DISPUTED JOINT COAL SAMPLES ANALYSIS REPORT PERTAINING TO STPP/JAIPUR &SRP CHP-3494(SRIRAMPUR) FOR THE MONTH OF FEBRUARY-2025

DECLARED GRADE: " G10 -CRR "

Particulars	SAP Sample NO	Date of Loading	RR.NO	Quantity (T)	SCCL RESULTS				STPP RESULTS				FINAL RESULTS			
					Moi%	Ash%	GCV K.Cal/Kg	Gr	Moi%	Ash%	GCV K.Cal/Kg	Gr	Moi%	Ash%	GCV K.Cal/Kg	Gr
SRP/CHP/IKOCP/STPP/02/25/71	91258	02.02.25	461002782	3838.92	5.69	34.33	4473	G10	5.61	36.86	4276	G11	5.86	33.96	4489	G10

Dy.GM(Coal Quality)
STPP

Supdt.(AS)
STPP

Addl. Manager(QM)
SRPArea
Incharge (QM)
Srirampur Area

Jr.Scientific Officer,
Reg. Analytical Lab MM

THE SINGARENI COLLIERIES COMPANY LIMITED
(A Government Company)
REGIONAL ANALYTICAL LABORATORY MANDAMARRI

: MMR/RAL/Q/25/299

Date: 29.03.2025

DISPUTED JOINT COAL SAMPLES ANALYSIS REPORT PERTAINING TO STPP/JAIPUR &SRP CHP-3494(SRIRAMPUR) FOR THE MONTH OF FEBRUARY-2025

DECLARED GRADE: " G8 -CRR "

Particulars	SAP Sample NO	Date of Loading	RR.NO	Quantity (T)	SCCL RESULTS				STPP RESULTS				FINAL RESULTS			
					Moi%	Ash%	GCV K.Cal/Kg	Gr	Moi%	Ash%	GCV K.Cal/Kg	Gr	Moi%	Ash%	GCV K.Cal/Kg	Gr
SRP/CHP/IKOCP/STPP/02/25/72	92218	17.02.25	461002811	3838.46	6.20	28.57	4931	G8	5.61	32.00	4645	G9	6.09	28.11	5005	G8
SRP/CHP/IKOCP/STPP/02/25/73	92801	24.02.25	461002828	3839.32	6.50	27.51	5016	G8	5.59	34.23	4435	G10	6.14	35.69	4326	G10
SRP/CHP/IKOCP/STPP/02/25/75	92927	26.02.25	461002833	3780.84	6.34	27.76	5032	G8	6.26	36.17	4173	G11	6.20	36.21	4285	G11
SRP/CHP/IKOCP/STPP/02/25/76	92987	27.02.25	461002836	3775.94	6.31	27.91	5020	G8	6.25	28.97	4876	G9	6.23	27.48	4999	G8

Dy.GM(Coal Quality)
STPP

Supdt.(AS)
STPP

Addl. Manager(QM)
SRP Area

Incharge (QM)
Srirampur Area

Jr.Scientific Officer,
Reg. Analytical Lab MM

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THE SINGARENI COLLIERIES COMPANY LIMITED
(A Government Company)
REGIONAL ANALYTICAL LABORATORY MANDAMARRI

Ref: MMR/RAL/Q/25/299

Date: 28.03.2025

STPP JOINT COAL SAMPLES ANALYSIS RESULTS EXCHANGE FOR THE PERIOD FROM 01.02.25 TO 28.02.2025

SRP OCP TO M/s. SINGARENI THERMAL POWER PLANT (JAIPUR)

DECLARED GRADE: " G10 - CRR "

Sl. No.	Particulars	SAP Sample NO	Date of Loading	R.R.NO	Quantity (T)	SCCL RESULTS				STPP RESULTS				Final	Total
						Mol%	Ash%	GCV K.Cal/Kg	Gr	Mol%	Ash%	GCV K.Cal/Kg	Gr	Grade	Moist %
1	SRP/OCP/STPP/02/25/339-G10	91432	01.02.25	461003033	3853.06	5.58	35.98	4363	G10	5.62	45.14	3418	G13	Disp	9.99
2	SRP/OCP/STPP/02/25/340-G10	91433	01.02.25	461003034	3850.06	5.56	36.31	4340	G10	5.61	35.22	4310	G10	G10	9.65
3	SRP/OCP/STPP/02/25/341-G10	91434	02.02.25	461003035	3852.02	5.54	36.50	4331	G10	5.65	35.39	4308	G10	G10	9.92
4	SRP/OCP/STPP/02/25/342-G10	91435	02.02.25	461003036	3854.72	5.56	36.34	4340	G10	5.66	41.83	3705	G12	Disp	10.02
5	SRP/OCP/STPP/02/25/343-G10	91436	02.02.25	461003037	3849.02	5.54	36.61	4322	G10	5.68	45.18	3439	G13	Disp	9.74
6	SRP/OCP/STPP/02/25/344-G10	91438	03.02.25	461003039	3848.20	5.56	36.34	4338	G10	5.72	35.31	4310	G10	G10	9.81
7	SRP/OCP/STPP/02/25/345-G10	91439	03.02.25	461003040	3854.80	5.58	36.07	4356	G10	5.65	35.75	4304	G10	G10	9.89
8	SRP/OCP/STPP/02/25/346-G10	91441	04.02.25	461003042	3856.86	5.55	36.50	4315	G10	5.66	45.10	3410	G13	Disp	9.99
9	SRP/OCP/STPP/02/25/347-G10	91442	04.02.25	461003043	3850.22	5.58	35.70	4397	G10	5.68	42.26	3705	G12	Disp	9.98
10	SRP/OCP/STPP/02/25/348-G10	91444	05.02.25	461003045	3849.06	5.59	35.78	4383	G10	5.61	45.33	3407	G13	Disp	9.95
11	SRP/OCP/STPP/02/25/349-G10	91672	06.02.25	461003046	3839.60	5.59	36.02	4363	G10	5.66	39.10	4010	G11	Disp	9.99
12	SRP/OCP/STPP/02/25/350-G10	91673	06.02.25	461003047	3843.98	5.57	35.86	4380	G10	5.69	36.04	4322	G10	G10	9.91
13	SRP/OCP/STPP/02/25/351-G10	91674	06.02.25	461003048	3847.58	5.58	36.71	4324	G10	5.76	41.74	3704	G12	Disp	10.05
14	SRP/OCP/STPP/02/25/352-G10	91676	07.02.25	461003049	3849.09	5.56	36.54	4336	G10	5.67	45.12	3402	G13	Disp	9.98
15	SRP/OCP/STPP/02/25/353-G10	91677	07.02.25	461003050	3838.64	5.55	36.43	4346	G10	5.7	35.87	4316	G10	G10	9.92
16	SRP/OCP/STPP/02/25/354-G10	91678	07.02.25	461003051	3841.24	5.62	35.60	4396	G10	5.68	45.05	3406	G13	Disp	10.03
17	SRP/OCP/STPP/02/25/355-G10	91679	08.02.25	461003052	3848.66	5.59	35.97	4366	G10	5.65	40.92	3862	G12	Disp	9.73
18	SRP/OCP/STPP/02/25/356-G10	91680	08.02.25	441000280	3842.44	5.53	36.86	4321	G10	5.69	38.09	4042	G11	Disp	9.91
19	SRP/OCP/STPP/02/25/358-G10	91971	09.02.25	461003055	3848.98	5.60	36.05	4357	G10	5.7	45.55	3402	G13	Disp	10.02
20	SRP/OCP/STPP/02/25/359-G10	91978	10.02.25	461003056	3844.30	5.56	35.96	4371	G10	5.73	35.76	4307	G10	G10	10.06
21	SRP/OCP/STPP/02/25/360-G10	91979	10.02.25	461003057	3851.68	5.58	35.89	4379	G10	5.74	35.75	4312	G10	G10	9.83
22	SRP/OCP/STPP/02/25/361-G10	91980	10.02.25	461003058	3849.34	5.59	35.35	4422	G10	5.71	35.73	4310	G10	G10	9.88
23	SRP/OCP/STPP/02/25/362-G10	91981	11.02.25	461003059	3847.38	5.55	36.04	4370	G10	5.68	40.76	3811	G12	Disp	9.79
24	SRP/OCP/STPP/02/25/363-G10	91982	11.02.25	461003060	3844.84	5.57	35.69	4392	G10	5.74	36.23	4208	G11	Disp	9.81
25	SRP/OCP/STPP/02/25/364-G10	91983	11.02.25	461003061	3841.52	5.53	36.62	4323	G10	5.76	35.22	4308	G10	G10	9.79
26	SRP/OCP/STPP/02/25/365-G10	91984	11.02.25	461003062	3845.20	5.59	35.48	4416	G10	5.7	40.97	3782	G12	Disp	9.80
27	SRP/OCP/STPP/02/25/366-G10	92052	12.02.25	461003063	3851.32	5.57	35.78	4386	G10	5.72	45.23	3411	G13	Disp	9.74
28	SRP/OCP/STPP/02/25/367-G10	92058	12.02.25	461003064	3851.46	6.18	35.25	4344	G10	5.69	38.20	4029	G11	Disp	9.86
29	SRP/OCP/STPP/02/25/368-G10	92060	13.02.25	461003065	3785.32	6.13	35.80	4328	G10	5.73	35.04	4315	G10	G10	9.84
30	SRP/OCP/STPP/02/25/369-G10	92061	13.02.25	461003066	3786.62	6.20	35.21	4354	G10	5.7	36.17	4207	G11	Disp	9.94

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31	SRP/OCP/STPP/02/25/370-G10	92062	13.02.25	461003067	3847.64	6.16	35.49	4323	G10	5.74	36.51	4206	G11	Disp	9.92
32	SRP/OCP/STPP/02/25/371-G10	92064	14.02.25	461003068	3848.36	6.19	35.25	4341	G10	5.71	35.74	4319	G10	G10	10.07
33	SRP/OCP/STPP/02/25/373-G10	92157	15.02.25	441000281	3846.26	6.17	35.23	4351	G10	5.79	35.06	4306	G10	G10	10.14
34	SRP/OCP/STPP/02/25/374-G10	92158	15.02.25	461003071	3851.54	6.13	35.29	4361	G10	5.76	35.15	4315	G10	G10	9.70
35	SRP/OCP/STPP/02/25/375-G10	92159	15.02.25	461003072	3846.92	6.09	35.79	4327	G10	5.76	41.06	3773	G12	Disp	9.97
36	SRP/OCP/STPP/02/25/376-G10	92161	16.02.25	441000282	3852.46	6.15	35.82	4322	G10	5.74	35.09	4312	G10	G10	9.72
37	SRP/OCP/STPP/02/25/377-G10	92896	16.02.25	461003073	3851.62	6.02	35.96	4339	G10	5.75	38.27	4009	G11	Disp	9.72
38	SRP/OCP/STPP/02/25/385-G10	92906	19.02.25	461003080	3830.14	6.23	35.06	4356	G10	5.79	38.00	4020	G11	Disp	9.92
39	SRP/OCP/STPP/02/25/386-G10	92905	19.02.25	451000075	3908.90	6.20	35.44	4324	G10	5.73	35.18	4343	G10	G10	9.87
40	SRP/OCP/STPP/02/25/387-G10	92907	20.02.25	461003081	3784.04	6.26	34.93	4362	G10	5.76	35.17	4304	G10	G10	10.02
41	SRP/OCP/STPP/02/25/388-G10	92908	20.02.25	461003082	3782.80	6.22	35.14	4351	G10	5.75	40.09	3882	G12	Disp	9.80
42	SRP/OCP/STPP/02/25/389-G10	92909	21.02.25	461003083	3911.18	6.28	34.85	4375	G10	5.78	36.05	4303	G10	G10	9.74
43	SRP/OCP/STPP/02/25/391-G10	92910	21.02.25	461003085	3779.30	6.24	35.01	4361	G10	5.8	34.95	4312	G10	G10	9.81
44	SRP/OCP/STPP/02/25/393-G10	92914	22.02.25	461003088	3909.22	6.19	35.26	4344	G10	5.74	38.60	4014	G11	Disp	9.89
45	SRP/OCP/STPP/02/25/395-G10	92920	24.02.25	461003091	3855.30	6.35	34.79	4361	G10	5.76	35.30	4303	G10	G10	9.99
46	SRP/OCP/STPP/02/25/397-G10	92921	24.02.25	461003093	3849.86	6.16	32.77	4589	G10	5.78	37.36	4108	G11	Disp	10.07
47	SRP/OCP/STPP/02/25/398-G10	92923	25.02.25	461003094	3778.88	6.20	32.63	4595	G10	5.81	41.44	3724	G12	Disp	9.90
48	SRP/OCP/STPP/02/25/399-G10	92924	26.02.25	461003095	3836.38	6.04	35.03	4380	G10	5.63	36.29	4312	G10	G10	10.14
49	SRP/OCP/STPP/02/25/400-G10	93155	27.02.25	461003096	3841.94	6.25	35.49	4325	G10	4.65	36.39	4318	G10	G10	9.70
50	SRP/OCP/STPP/02/25/402-G10	93157	27.02.25	461003098	3838.32	6.22	35.58	4318	G10	5.6	35.46	4307	G10	G10	9.72
51	SRP/OCP/STPP/02/25/403-G10	93158	28.02.25	461003099	3838.06	6.18	34.81	4390	G10	5.63	38.30	4109	G11	Disp	9.72
52	SRP/OCP/STPP/02/25/404-G10	93160	28.02.25	451000076	3837.22	6.11	35.04	4380	G10	5.62	35.36	4269	G11	Disp	9.95

1	No. of samples exchanged :	52 (Fifty two only)
2	Disputed samples :	29 (Twenty nine only)
3	Agreed samples 'G10' grade :	23 (Twenty three only)
4	Agreed samples 'G11' grade :	(Zero)
5	Agreed samples 'G12' grade :	(Zero)
6	Agreed samples 'G13' grade :	(Zero)
7	Agreed samples 'G14' grade :	(Zero)

Dy.GM(Coal Quality)
STPP

Supdt.(AS)
STPP

Addl. Manager(QM)
Incharge (QM)
Srirampur Area

Jr.Scientific Officer,
Reg. Analytical Lab MM

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THE SINGARENI COLLIERIES COMPANY LIMITED
(A Government Company)
REGIONAL ANALYTICAL LABORATORY MANDAMARRI

Ref: MMR/RAL/Q/25/296

Date: 28.03.2025

STPP JOINT COAL SAMPLES ANALYSIS RESULTS EXCHANGE FOR THE PERIOD FROM 01.02.2025 TO 28.02.2025

SRP CHP TO M/s. SINGARENI THERMAL POWER PLANT (JAIPUR)

DECLARED GRADE: " G10 - CRR "

Sl. No.	Particulars	SAP Sample NO	Date of Loading	RR.NO	Quantity (T)	SCCL RESULTS				STPP RESULTS				Final	Total
						Mol%	Ash%	GCV K.Cal/Kg	Gr	Mol%	Ash%	GCV K.Cal/Kg	Gr	Grade	Moist %
1	SRP/CHP/STPP/02/25/318	91207	01.02.25	461002779	3839.86	5.59	35.86	4372	G10	5.65	35.27	4303	G10	G10	9.90
2	SRP/CHP/STPP/02/25/319	91257	02.02.25	461002781	3843.36	5.61	35.65	4396	G10	5.68	35.17	4307	G10	G10	9.70
3	SRP-CHP/STPP/2/25/320	91425	03.02.25	461002783	3838.24	5.55	36.23	4348	G10	5.72	43.71	3510	G13	Disp	9.95
4	SRP-CHP/STPP/2/25/321	91426	03.02.25	461002784	3838.74	5.54	36.37	4338	G10	5.7	41.23	3758	G12	Disp	10.08
5	SRP-CHP/STPP/2/25/322	91427	04.02.25	461002785	3838.78	5.56	36.12	4352	G10	5.68	36.08	4272	G11	Disp	9.99
6	SRP-CHP/STPP/2/25/323	91491	05.02.25	461002787	3836.36	5.59	35.73	4389	G10	5.65	38.01	4084	G11	Disp	9.84
7	SRP-CHP/STPP/2/25/324	91522	06.02.25	461002789	3846.20	5.52	36.40	4333	G10	5.63	35.60	4308	G10	G10	9.81
8	SRP-CHP/STPP/2/25/325	91523	06.02.25	461002790	3844.36	5.62	35.17	4402	G10	5.62	40.62	3820	G12	Disp	9.97
9	SRP-CHP/STPP/2/25/326	91555	07.02.25	461002791	3843.18	5.56	36.22	4344	G10	5.68	35.34	4303	G10	G10	9.90
10	SRP-CHP/STPP/2/25/327	91556	07.02.25	461002792	3845.24	5.52	36.31	4339	G10	5.65	43.44	3552	G13	Disp	9.70
11	SRP-CHP/STPP/2/25/328	91626	08.02.25	461002793	3844.96	5.53	36.64	4328	G10	5.67	43.11	3561	G13	Disp	10.05
12	SRP-CHP/STPP/2/25/329	91629	08.02.25	461002794	3839.42	5.55	36.39	4335	G10	5.68	40.72	3828	G12	Disp	9.83
13	SRP-CHP/STPP/2/25/330	91665	09.02.25	461002795	3838.64	5.63	35.42	4397	G10	5.7	40.44	3845	G12	Disp	9.79
14	SRP-CHP/STPP/2/25/331	91666	09.02.25	461002796	3839.28	5.58	36.23	4341	G10	5.72	35.99	4304	G10	G10	9.79
15	SRP/CHP/STPP/02/25/332	91950	10.02.25	461002797	3837.80	5.62	35.11	4425	G10	5.65	35.88	4306	G10	G10	9.74
16	SRP/CHP/STPP/02/25/333	91952	10.02.25	461002798	3838.00	5.59	35.48	4411	G10	5.68	42.59	3632	G13	Disp	9.84
17	SRP/CHP/STPP/02/25/334	91953	11.02.25	461002799	3839.98	5.61	35.12	4333	G10	5.66	44.97	3444	G13	Disp	10.16
18	SRP/CHP/STPP/02/25/335	91956	12.02.25	461002800	3838.72	5.52	36.15	4370	G10	5.67	35.85	4286	G11	Disp	10.05
19	SRP/CHP/STPP/02/25/336	91957	12.02.25	461002801	3846.14	6.50	34.91	4329	G10	5.7	36.23	4304	G10	G10	9.85
20	SRP/CHP/STPP/02/25/337	91959	13.02.25	461002802	3837.22	6.30	35.22	4355	G10	5.69	36.08	4302	G10	G10	9.87
21	SRP/CHP/STPP/02/25/338	92202	13.02.25	461002803	3837.34	6.13	34.85	4395	G10	5.7	35.96	4306	G10	G10	9.80
22	SRP/CHP/STPP/02/25/339	92203	13.02.25	461002805	3775.78	6.10	35.08	4373	G10	5.68	36.28	4307	G10	G10	9.79
23	SRP/CHP/STPP/02/25/340	92205	14.02.25	461002804	3781.36	6.18	35.17	4354	G10	5.65	41.69	3767	G12	Disp	9.79
24	SRP/CHP/STPP/02/25/341	92209	15.02.25	461002807	3821.92	6.13	35.88	4327	G10	5.76	44.93	3423	G13	Disp	9.83
25	SRP/CHP/STPP/02/25/342	92214	16.02.25	461002808	3824.22	6.18	35.52	4335	G10	5.78	39.06	3978	G12	Disp	9.86
26	SRP/CHP/STPP/02/25/343	92215	16.02.25	461002809	3822.42	6.15	35.59	4344	G10	5.8	35.22	4313	G10	G10	10.10
27	SRP/CHP/STPP/02/25/344	92217	17.02.25	461002810	3824.50	6.10	35.81	4330	G10	5.81	35.24	4318	G10	G10	10.10
28	SRP/CHP/STPP/02/25/345	92324	18.02.25	461002812	3836.30	6.08	35.90	4333	G10	5.79	35.60	4310	G10	G10	9.99
29	SRP/CHP/STPP/02/25/346	92325	18.02.25	461002813	3840.14	6.13	35.50	4351	G10	5.8	44.37	3495	G13	Disp	9.96
30	SRP/CHP/STPP/02/25/347	92452	19.02.25	461002815	3911.60	6.17	35.32	4345	G10	5.74	35.47	4308	G10	G10	10.08
31	SRP/CHP/STPP/02/25/348	92454	20.02.25	461002817	3827.16	6.19	35.20	4349	G10	5.76	45.06	3435	G13	Disp	10.09

32	SRP/CHP/STPP/02/25/349	92512	20.02.25	461002818	3906.42	6.10	35.87	4338	G10	5.68	35.55	4299	G11	Disp	10.06
33	SRP/CHP/STPP/02/25/350	92514	21.02.25	461002819	3905.22	6.23	35.15	4349	G10	5.67	35.23	4305	G10	G10	9.92
34	SRP/CHP/STPP/02/25/351	92515	21.02.25	461002820	3908.56	6.21	35.20	4355	G10	5.68	35.05	4314	G10	G10	10.07
35	SRP/CHP/STPP/02/25/352	92543	22.02.25	461002821	3911.42	6.15	35.72	4328	G10	5.63	38.06	4097	G11	Disp	10.14
36	SRP/CHP/STPP/02/25/353	92544	22.02.25	461002822	3776.40	6.17	35.67	4337	G10	5.67	35.84	4304	G10	G10	9.97
37	SRP/CHP/STPP/02/25/354	92630	23.02.25	461002824	3776.22	6.25	34.91	4370	G10	5.64	35.50	4297	G11	Disp	9.72
38	SRP/CHP/STPP/02/25/355	92631	23.02.25	461002825	3779.26	6.19	35.35	4335	G10	5.64	35.38	4314	G10	G10	9.82
39	SRP/CHP/STPP/02/25/356	92722	24.02.25	461002826	3838.26	6.24	35.52	4326	G10	5.67	34.24	4403	G10	G10	9.83
40	SRP/CHP/STPP/02/25/357	92723	24.02.25	461002827	3776.48	6.31	35.21	4333	G10	5.61	35.35	4343	G10	G10	9.89
41	SRP/CHP/STPP/02/25/358	92802	25.02.25	461002829	3839.80	6.26	35.34	4328	G10	5.65	38.52	4028	G11	Disp	9.96
42	SRP/CHP/STPP/02/25/359	92803	25.02.25	461002830	3844.76	6.29	35.27	4337	G10	5.66	35.74	4279	G11	Disp	10.07
43	SRP/CHP/STPP/02/25/360	92926	26.02.25	461002832	3836.36	6.33	35.33	4334	G10	5.67	41.66	3775	G12	Disp	9.68
44	SRP/CHP/STPP/02/25/361	92932	27.02.25	461002834	3841.74	6.30	35.43	4322	G10	5.69	37.68	4171	G11	Disp	9.88
45	SRP/CHP/STPP/02/25/362	92986	27.02.25	461002835	3837.36	6.35	35.25	4330	G10	5.65	36.03	4304	G10	G10	9.81
46	SRP/CHP/STPP/02/25/363	93044	28.02.25	461002837	3775.36	6.37	34.87	4359	G10	5.68	35.06	4363	G10	G10	9.86

1	No. of samples exchanged :	46 (Forty six only)
2	Disputed samples :	24 (Twenty four only)
3	Agreed samples 'G10' grade :	22 (Twenty two only)
4	Agreed samples 'G11' grade :	0 (Zero)
5	Agreed samples 'G12' grade :	0 (Zero)
6	Agreed samples 'G13' grade :	0 (Zero)
7	Agreed samples 'G14' grade :	(Zero)

Dy.GM(Coal Quality)
STPP

Supdt.(AS)
STPP

Addl. Manager(QM)
Incharge (QM)
Srirampur Area

Jr.Scientific Officer,
Reg. Analytical Lab MM

THE SINGARENI COLLIERIES COMPANY LIMITED
(A Government Company)
REGIONAL ANALYTICAL LABORATORY, MANDAMARRI.

Ref: MMR/RAL/Q/25/297

Date: 29.03.2025

DISPUTED JOINT COAL SAMPLES ANALYSIS REPORT PERTAINING TO STPP/JAIPUR & SRP OCP(SRIRAMPUR) FOR THE MONTH OF FEBRUARY-2025

DECLARED GRADE: " G10 - CRR "

Sl. No.	Particulars	SAP Sample NO	Date of Loading	RR.NO	Quantity (T)	SCCL RESULTS				STPP RESULTS				FINAL RESULTS			
						Moi%	Ash%	GCV K.Cal/Kg	Gr	Moi%	Ash%	GCV K.Cal/Kg	Gr	Moi%	Ash%	GCV K.Cal/Kg	Gr
1	SRP/OCP/STPP/02/25/339-G10	91432	01.02.25	461003033	3853.06	5.58	35.98	4363	G10	5.62	45.14	3418	G13	4.78	45.10	3510	G13
2	SRP/OCP/STPP/02/25/342-G10	91435	02.02.25	461003036	3854.72	5.56	36.34	4340	G10	5.66	41.83	3705	G12	5.59	40.67	3971	G12
3	SRP/OCP/STPP/02/25/343-G10	91436	02.02.25	461003037	3849.02	5.54	36.61	4322	G10	5.68	45.18	3439	G13	5.71	44.19	3573	G13
4	SRP/OCP/STPP/02/25/346-G10	91441	04.02.25	461003042	3856.86	5.55	36.50	4315	G10	5.66	45.10	3410	G13	5.42	43.01	3480	G13
5	SRP/OCP/STPP/02/25/347-G10	91442	04.02.25	461003043	3850.22	5.58	35.70	4397	G10	5.68	42.26	3705	G12	6.39	38.30	3855	G12
6	SRP/OCP/STPP/02/25/348-G10	91444	05.02.25	461003045	3849.06	5.59	35.78	4383	G10	5.61	45.33	3407	G13	4.95	46.17	3490	G13
7	SRP/OCP/STPP/02/25/349-G10	91672	06.02.25	461003046	3839.60	5.59	36.02	4363	G10	5.66	39.10	4010	G11	5.60	35.62	4396	G10
8	SRP/OCP/STPP/02/25/351-G10	91674	06.02.25	461003048	3847.58	5.58	36.71	4324	G10	5.76	41.74	3704	G12	5.80	40.16	3933	G12
9	SRP/OCP/STPP/02/25/352-G10	91676	07.02.25	461003049	3849.09	5.56	36.54	4336	G10	5.67	45.12	3402	G13	5.79	44.18	3505	G13
10	SRP/OCP/STPP/02/25/354-G10	91678	07.02.25	461003051	3841.24	5.62	35.60	4396	G10	5.68	45.05	3406	G13	5.69	45.44	3527	G13
11	SRP/OCP/STPP/02/25/355-G10	91679	08.02.25	461003052	3848.66	5.59	35.97	4366	G10	5.65	40.92	3862	G12	6.01	39.61	3982	G12
12	SRP/OCP/STPP/02/25/356-G10	91680	08.02.25	441000280	3842.44	5.53	36.86	4321	G10	5.69	38.09	4042	G11	5.63	35.58	4398	G10
13	SRP/OCP/STPP/02/25/358-G10	91971	09.02.25	461003055	3848.98	5.60	36.05	4357	G10	5.7	45.55	3402	G13	4.98	46.37	3491	G13
14	SRP/OCP/STPP/02/25/362-G10	91981	11.02.25	461003059	3847.38	5.55	36.04	4370	G10	5.68	40.76	3811	G12	5.74	40.15	3990	G12
15	SRP/OCP/STPP/02/25/363-G10	91982	11.02.25	461003060	3844.84	5.57	35.69	4392	G10	5.74	36.23	4208	G11	5.65	36.15	4340	G10
16	SRP/OCP/STPP/02/25/365-G10	91984	11.02.25	461003062	3845.20	5.59	35.48	4416	G10	5.7	40.97	3782	G12	5.67	39.47	3967	G12
17	SRP/OCP/STPP/02/25/366-G10	92052	12.02.25	461003063	3851.32	5.57	35.78	4386	G10	5.72	45.23	3411	G13	5.86	43.80	3555	G13
18	SRP/OCP/STPP/02/25/367-G10	92058	12.02.25	461003064	3851.46	6.18	35.25	4344	G10	5.69	38.20	4029	G11	5.68	34.80	4402	G10

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19	SRP/OCP/STPP/02/25/369-G10	92061	13.02.25	461003066	3786.62	6.20	35.21	4354	G10	5.7	36.17	4207	G11	5.66	36.06	4342	G10
20	SRP/OCP/STPP/02/25/370-G10	92062	13.02.25	461003067	3847.64	6.16	35.49	4323	G10	5.74	36.51	4206	G11	5.58	36.33	4327	G10
21	SRP/OCP/STPP/02/25/375-G10	92159	15.02.25	461003072	3846.92	6.09	35.79	4327	G10	5.76	41.06	3773	G12	5.66	35.28	4407	G10
22	SRP/OCP/STPP/02/25/377-G10	92696	16.02.25	461003073	3851.62	6.02	35.96	4339	G10	5.75	38.27	4009	G11	5.63	35.87	4368	G10
23	SRP/OCP/STPP/02/25/385-G10	92906	19.02.25	461003080	3830.14	6.23	35.06	4356	G10	5.79	38.00	4020	G11	5.61	36.01	4361	G10
24	SRP/OCP/STPP/02/25/388-G10	92908	20.02.25	461003082	3782.80	6.22	35.14	4351	G10	5.75	40.09	3882	G12	5.64	35.54	4405	G10
25	SRP/OCP/STPP/02/25/393-G10	92914	22.02.25	461003088	3909.22	6.19	35.26	4344	G10	5.74	38.60	4014	G11	5.68	36.27	4334	G10
26	SRP/OCP/STPP/02/25/397-G10	92921	24.02.25	461003093	3849.86	6.16	32.77	4589	G10	5.78	37.36	4108	G11	5.83	35.30	4388	G10
27	SRP/OCP/STPP/02/25/398-G10	92923	25.02.25	461003094	3778.88	6.20	32.63	4595	G10	5.81	41.44	3724	G12	5.63	35.58	4398	G10
28	SRP/OCP/STPP/02/25/403-G10	93158	28.02.25	461003099	3838.06	6.18	34.81	4390	G10	5.63	38.30	4109	G11	5.60	35.53	4402	G10
29	SRP/OCP/STPP/02/25/404-G10	93160	28.02.25	451000076	3837.22	6.11	35.04	4380	G10	5.62	35.36	4269	G11	5.58	36.14	4364	G10

Dy.GM(Coal Quality)
STPP

Supdt.(AS)
STPP

Addl. Manager(QM)
SRP Area
Incharge (QM)
Srirampur Area

Jr.Scientific Officer,
Reg. Analytical Lab MM

(62)

THE SINGARENI COLLIERIES COMPANY LIMITED
(A Government Company)
REGIONAL ANALYTICAL LABORATORY MANDAMARRI

Ref: MMR/RAL/Q/24/1257

Date: 16.08.2024

STPP JOINT COAL SAMPLES ANALYSIS RESULTS EXCHANGE FOR THE PERIOD FROM 01.07.2024 TO 31.07.2024

SRP CHP TO M/s. SINGARENI THERMAL POWER PLANT (JAIPUR)

DECLARED GRADE: " G10 - CRR "

Sl. No.	Particulars	SAP Sample NO	Date of Loading	RR.NO	Quantity (T)	SCCL RESULTS				STPP RESULTS				Final Grade	Total Moist %
						Mol%	Ash%	GCV K.Cal/Kg	Gr	Mol%	Ash%	GCV K.Cal/Kg	Gr		
1	SRP/CHP/STPP/07/24/97	76544	01.07.24	461002522	3761.34	5.59	36.50	4340	G10	5.63	35.56	4259	G11	Disp	10.66
2	SRP/CHP/STPP/07/24/98	76584	02.07.24	461002523	3768.62	5.66	35.42	4386	G10	5.64	35.26	4293	G11	Disp	10.32
3	SRP/CHP/STPP/07/24/99	76623	03.07.24	461002525	3766.74	5.64	35.55	4377	G10	5.64	35.44	4313	G10	G10	11.58
4	SRP/CHP/STPP/07/24/100	76624	03.07.24	461002526	3765.42	5.63	35.62	4352	G10	5.59	35.27	4310	G10	G10	11.36
5	SRP/CHP/STPP/07/24/101	76698	04.07.24	461002528	3763.54	5.60	36.14	4341	G10	5.66	35.87	4287	G11	Disp	11.15
6	SRP/CHP/STPP/07/24/102	76813	05.07.24	461002529	3769.50	5.63	35.90	4369	G10	5.65	35.26	4311	G10	G10	10.71
7	SRP/CHP/STPP/07/24/103	76815	06.07.24	461002531	3771.86	5.59	36.43	4341	G10	5.65	35.37	4297	G11	Disp	10.39
8	SRP/CHP/STPP/07/24/104	76816	06.07.24	461002532	3712.32	5.57	36.50	4336	G10	5.59	35.23	4312	G10	G10	10.54
9	SRP/CHP/STPP/07/24/105	76852	07.07.24	461002533	3719.76	5.64	36.03	4364	G10	5.64	35.41	4304	G10	G10	10.38
10	SRP/CHP/STPP/07/24/106	76954	09.07.24	461002535	3717.34	5.63	35.98	4359	G10	5.6	38.38	3997	G12	Disp	11.25
11	SRPCHP/STPP/07/24/107	77067	11.07.24	461002537	3644.20	5.63	36.28	4356	G10	5.62	35.64	4303	G10	G10	11.41
12	SRPCHP/STPP/07/24/108	77130	12.07.24	461002538	3639.90	5.66	35.81	4379	G10	5.59	34.99	4302	G10	G10	9.87
13	SRPCHP/STPP/07/24/109	77131	12.07.24	461002539	3771.68	5.69	35.26	4391	G10	5.64	35.37	4294	G11	Disp	10.91
14	SRPCHP/STPP/07/24/110	77203	13.07.24	461002541	3783.86	5.68	35.51	4383	G10	5.69	35.24	4303	G10	G10	11.29
15	SRPCHP/STPP/07/24/111	77230	14.07.24	461002542	3784.42	5.59	36.51	4346	G10	5.67	38.90	3981	G12	Disp	11.36
16	SRP/CHP/STPP/07/24/112	77526	16.07.24	461002544	3783.54	5.69	34.80	4408	G10	5.7	35.23	4304	G10	G10	11.46
17	SRP/CHP/STPP/07/24/113	77527	16.07.24	441000187	3786.66	5.66	35.45	4391	G10	5.68	38.16	3992	G12	Disp	11.23
18	SRP/CHP/STPP/07/24/114	77529	18.07.24	461002545	3776.72	5.64	35.57	4367	G10	5.65	35.25	4305	G10	G10	10.71
19	SRP/CHP/STPP/07/24/115	77531	19.07.24	461002546	3778.36	5.68	34.70	4416	G10	5.67	35.09	4312	G10	G10	10.84
20	SRP/CHP/STPP/07/24/116	77775	20.07.24	461002547	3782.28	5.59	36.03	4359	G10	5.73	35.80	4296	G11	Disp	11.23
21	SRP/CHP/STPP/07/24/117	77776	21.07.24	441000190	3783.34	5.62	35.75	4387	G10	5.81	35.26	4306	G10	G10	11.41
22	SRP/CHP/STPP/07/24/118	77777	23.07.24	461002548	3777.68	5.68	35.35	4347	G10	5.84	35.14	4296	G11	Disp	11.37
23	SRP/CHP/STPP/07/24/119	77795	24.07.24	461002549	3778.96	5.63	35.69	4368	G10	5.79	35.38	4302	G10	G10	11.29
24	SRP/CHP/STPP/07/24/120	77876	26.07.24	461002551	3780.86	5.66	35.59	4377	G10	5.76	38.63	3968	G12	Disp	10.91
25	SRP/CHP/STPP/07/24/121	77893	27.07.24	461002552	3777.26	5.59	36.40	4354	G10	5.64	35.52	4292	G11	Disp	10.49
26	SRP/CHP/STPP/07/24/122	78007	28.07.24	461002553	3775.92	5.65	35.63	4395	G10	5.67	39.23	3939	G12	Disp	10.51

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27	SRP/CHP/STPP/07/24/123	78105	30.07.24	461002554	3780.44	5.70	34.84	4417	G10	5.63	36.15	4293	G11	Disp	10.73
28	SRP/CHP/STPP/07/24/124	78122	31.07.24	461002555	3785.96	5.67	35.31	4391	G10	5.69	36.11	4294	G11	Disp	10.32

1	**No. of samples exchanged :**	28 (Twenty eight only)
2	**Disputed samples :**	15 (Fifteen only)
3	**Agreed samples 'G10' grade :**	13 (Thirteen only)
4	**Agreed samples 'G11' grade :**	0 (Zero)
5	**Agreed samples 'G12' grade :**	0 (Zero)
6	**Agreed samples 'G13' grade :**	0 (Zero)
7	**Agreed samples 'G14' grade :**	(Zero)

Dy.GM(Coal Quality)
STPP

Supdt.(AS)
STPP

Addl. Manager(QM)
SRPArea

Jr.Scientific Officer,
Reg. Analytical Lab MM

(84)

THE SINGARENI COLLIERIES COMPANY LIMITED
(A Government Company)
REGIONAL ANALYTICAL LABORATORY MANDAMARRI

Ref: MMR/RAL/Q/24/ 1258

Date: 16.08.2024

STPP JOINT COAL SAMPLES ANALYSIS RESULTS EXCHANGE FOR THE PERIOD FROM 01.07.24 TO 31.07.2024

SRPCHP(IK OCP-3494) TO M/s. SINGARENI THERMAL POWER PLANT (JAIPUR)

DECLARED GRADE: " G10 - CRR "

Sl. No.	Particulars	SAP Sample No.	Date of Loading	RR.NO	Quantity (T)	SCCL RESULTS				STPP RESULTS				Final Grade	Total Moist %
						Mol%	Ash%	GCV K.Cal/Kg	Gr	Mol%	Ash%	GCV K.Cal/Kg	Gr		
1	SRP/CHP/IKOCP/STPP/07/24/36	77202	13.07.24	461002540	3769.94	5.76	33.89	4454	G10	5.68	36.09	4304	G10	G10	11.37

1 No. of samples exchanged : 1 (One only)
2 Disputed samples : 0 (Zero)
3 Agreed samples 'G10' grade : 1 (One only)
4 Agreed samples 'G11' grade : 0 (Zero)
5 Agreed samples 'G12' grade : 0 (Zero)

Dy.GM(Coal Quality)
STPP

Supdt.(AS)
STPP

Addl. Manager(QM)
SRPArea

Jr.Scientific Officer,
Reg. Analytical Lab MM

THE SINGARENI COLLIERIES COMPANY LIMITED
(A Government Company)
REGIONAL ANALYTICAL LABORATORY MANDAMARRI

65

Ref: MMR/RAL/Q/24/1259

Date: 16.08.2024

STPP JOINT COAL SAMPLES ANALYSIS RESULTS EXCHANGE FOR THE PERIOD FROM 01.07.24 TO 31.07.2024

SRPCHP(IK OCP-3494) TO M/s. SINGARENI THERMAL POWER PLANT (JAIPUR)

DECLARED GRADE: " G8 - CRR "

Sl. No.	Particulars	SAP Sample No.	Date of Loading	RR.NO	Quantity (T)	SCCL RESULTS				STPP RESULTS				Final Grade	Total Moist %
						Moi%	Ash%	GCV K.Cal/Kg	Gr	Moi%	Ash%	GCV K.Cal/Kg	Gr		
1	SRP/CHP/IKOCP/STPP/07/24/30	76543	01.07.24	461002521	3763.12	6.06	28.66	4959	G8	6.09	28.34	4912	G8	G8	10.54
2	SRP/CHP/IKOCP/STPP/07/24/31	76585	02.07.24	461002524	3763.42	6.14	27.47	5012	G8	6.11	31.01	4698	G9	Disp	11.44
3	SRP/CHP/IKOCP/STPP/07/24/32	76697	04.07.24	461002527	3766.80	6.03	29.26	4943	G8	6.22	28.44	4907	G8	G8	11.16
4	SRP/CHP/IKOCP/STPP/07/24/33	76814	05.07.24	461002530	3767.04	6.05	28.92	4956	G8	6.24	32.65	4436	G10	Disp	11.46
5	SRP/CHP/IKOCP/STPP/07/24/34	76903	08.07.24	461002534	3722.18	6.06	28.53	4945	G8	6.26	28.54	4907	G8	G8	10.51
6	SRP/CHP/IKOCP/STPP/07/24/35	76955	09.07.24	461002536	3659.92	6.03	29.15	4971	G8	6.25	30.44	4714	G9	Disp	11.22
7	SRP/CHP/IKOCP/STPP/07/24/37	77303	15.07.24	461002543	3782.46	6.11	27.57	5004	G8	6.21	32.43	4504	G10	Disp	11.36
8	SRP/CHP/IKOCP/STPP/07/24/38	77528	17.07.24	441000188	3788.62	6.06	28.62	4973	G8	6.14	36.36	4210	G11	Disp	11.58
9	SRP/CHP/IKOCP/STPP/07/24/39	77530	19.07.24	441000189	3777.46	6.10	27.99	5008	G8	6.26	28.17	4904	G8	G8	10.72
10	SRP/CHP/IKOCP/STPP/07/24/40	77875	25.07.24	461002550	3777.46	6.08	28.74	4987	G8	6.21	35.11	4247	G11	Disp	11.43

1	No. of samples exchanged :	10 (Ten only)
2	Disputed samples :	6 (Six only)
3	Agreed samples 'G8' grade :	4 (Four only)
4	Agreed samples 'G9' grade :	0 (Zero)
5	Agreed samples 'G10' grade :	0 (Zero)
6	Agreed samples 'G11' grade :	0 (Zero)
7	Agreed samples 'G12' grade :	0 (Zero)

Dy.GM(Coal Quality)
STPP

L.I.V.
Supdt.(AS)
STPP

Addl. Manager(QM)
SRPArea

Jr.Scientific Officer,
Reg. Analytical Lab MM

(66)

THE SINGARENI COLLIERIES COMPANY LIMITED
(A Government Company)
REGIONAL ANALYTICAL LABORATORY MANDAMARRI

Ref: MMR/RAL/Q/23/1255

Date: 16.08.2024

STPP JOINT COAL SAMPLES ANALYSIS RESULTS EXCHANGE FOR THE PERIOD FROM 01.07.24 TO 31.07.2024

SRP OCP TO M/s. SINGARENI THERMAL POWER PLANT (JAIPUR)

DECLARED GRADE: " G10 - CRR "

Sl. No.	Particulars	SAP Sample NO	Date of Loading	R.R.NO	Quantity (T)	SCCL RESULTS				STPP RESULTS				Final	Total
						Mol%	Ash%	GCV K.Cal/Kg	Gr	Mol%	Ash%	GCV K.Cal/Kg	Gr	Grade	Moist %
1	SRP/OCP/STPP/07/24/48-G10	77269	09.07.24	461002659	3661.08	5.66	35.11	4381	G10	5.81	35.20	4309	G10	G10	11.58
2	SRP/OCP/STPP/07/24/49-G10	77272	10.07.24	461002661	3672.34	5.59	36.10	4339	G10	6.16	35.69	4261	G11	Disp	11.32
3	SRPOCP/STPP/07/24/50-G10	77276	12.07.24	461002663	3792.92	5.59	36.08	4376	G10	5.85	35.18	4304	G10	G10	11.02

1	No. of samples exchanged :	3 (Three only)
2	Disputed samples :	1 (One only)
3	Agreed samples 'G10' grade :	2 (Two only)
4	Agreed samples 'G11' grade :	(Zero)
5	Agreed samples 'G12' grade :	(Zero)
6	Agreed samples 'G13' grade :	(Zero)
7	Agreed samples 'G14' grade :	(Zero)

Dy.GM(Coal Quality)
STPP

Supdt.(AS)
STPP

Addl. Manager(QM)
SRPArea

Jr.Scientific Officer,
Reg. Analytical Lab MM

THE SINGARENI COLLIERIES COMPANY LIMITED
(A Government Company)
REGIONAL ANALYTICAL LABORATORY MANDAMARRI

(67)

Ref: MMR/RAL/Q/24/1256

Date: 16.08.2024

STPP JOINT COAL SAMPLES ANALYSIS RESULTS EXCHANGE FOR THE PERIOD FROM 01.06.24 TO 30.06.2024

SRP OCP TO M/s. SINGARENI THERMAL POWER PLANT (JAIPUR)

DECLARED GRADE: " G8 - CRR "

Sl. No.	Particulars	SAP Sample NO	Date of Loading	RR.NO	Quantity (T)	SCCL RESULTS				STPP RESULTS				Final	Total
						Moi%	Ash%	GCV K.Cal/Kg	Gr	Moi%	Ash%	GCV K.Cal/Kg	Gr	Grade	Moist %
1	SRP/OCP/STPP/07/24/47-G8	77268	08.07.24	461002658	3660.68	6.03	29.12	4978	G8	6.14	35.12	4308	G10	Disp	11.14

1	No. of samples exchanged :	1 (One only)
2	Disputed samples :	1 (One only)
3	Agreed samples 'G8' grade :	0 (Zero)
4	Agreed samples 'G9' grade :	0 (Zero)
5	Agreed samples 'G10' grade :	0 (Zero)
6	Agreed samples 'G11' grade :	0 (Zero)
7	Agreed samples 'G12' grade :	0 (Zero)

Dy.GM(Coal Quality)
STPP

L.J.V.
Supdt.(AS)
STPP

Addl. Manager(QM)
SRPArea

Jr.Scientific Officer,
Reg. Analytical Lab MM

THE SINGARENI COLLIERIES COMPANY LIMITED
(A Government Company)
REGIONAL ANALYTICAL LABORATORY MANDAMARRI

Ref: MMR/RAL/Q/24/1266

Date: 17.08.2024

DISPUTED JOINT COAL SAMPLES ANALYSIS REPORT PERTAINING TO STPP/JAIPUR &SRP CHP-3494(SRIRAMPUR) FOR THE MONTH OF JULY-2024

DECLARED GRADE: " G8 -CRR "

Sl. No.	Particulars	SAP Sample NO	Date of Loading	RR.NO	Quantity (T)	SCCL RESULTS				STPP RESULTS				FINAL RESULTS			
						Moi%	Ash%	GCV K.Cal/Kg	Gr	Moi%	Ash%	GCV K.Cal/Kg	Gr	Moi%	Ash%	GCV K.Cal/Kg	Gr
1	SRP/CHP/IKOCP/STPP/07/24/31	76585	02.07.24	461002524	3763.42	6.14	27.47	5012	G8	6.11	31.01	4698	G9	6.03	27.59	5046	G8
2	SRP/CHP/IKOCP/STPP/07/24/33	76814	05.07.24	461002530	3767.04	6.05	28.92	4956	G8	6.24	32.65	4436	G10	6.11	33.12	4569	G10
3	SRP/CHP/IKOCP/STPP/07/24/35	76955	09.07.24	461002536	3659.92	6.03	29.15	4971	G8	6.25	30.44	4714	G9	6.08	28.11	4996	G8
4	SRP/CHP/IKOCP/STPP/07/24/37	77303	15.07.24	461002543	3782.46	6.11	27.57	5004	G8	6.21	32.43	4504	G10	6.02	28.64	4986	G8
5	SRP/CHP/IKOCP/STPP/07/24/38	77528	17.07.24	441000188	3788.62	6.06	28.62	4973	G8	6.14	36.36	4210	G11	6.14	36.25	4289	G11
6	SRP/CHP/IKOCP/STPP/07/24/40	77875	25.07.24	461002550	3777.46	6.08	28.74	4987	G8	6.21	35.11	4247	G11	6.05	35.91	4267	G11

Dy.GM(Coal Quality)
STPP

Supdt.(AS)
STPP

Addl. Manager(QM)
SRPArea

Jr.Scientific Officer,
Reg. Analytical Lab MM

(69)

THE SINGARENI COLLIERIES COMPANY LIMITED
(A Government Company)
REGIONAL ANALYTICAL LABORATORY MANDAMARRI

Ref: MMR/RAL/Q/24/1262

Date: 17.08.2024

DISPUTED JOINT COAL SAMPLES ANALYSIS REPORT PERTAINING TO STPP/JAIPUR & SRP OCP(SRIRAMPUR) FOR THE MONTH OF JULY-2024

DECLARED GRADE: " G8- CRR "

Sl. No.	Particulars	SAP Sample NO	Date of Loading	RR.NO	Quantity (T)	SCCL RESULTS				STPP RESULTS				FINAL RESULTS			
						Moi%	Ash%	GCV K.Cal/Kg	Gr	Moi%	Ash%	GCV K.Cal/Kg	Gr	Moi%	Ash%	GCV K.Cal/Kg	Gr
1	SRP/OCP/STPP/07/24/47-G8	77268	08.07.24	461002658	3660.68	6.03	29.12	4978	G8	6.14	35.12	4308	G10	6.12	28.67	4982	G8

Dy.GM(Coal Quality)
STPP

Supdt.(AS)
STPP

Addl. Manager(QM)
SRPArea

Jr.Scientific Officer,
Reg. Analytical Lab MM

THE SINGARENI COLLIERIES COMPANY LIMITED
(A Government Company)
REGIONAL ANALYTICAL LABORATORY MANDAMARRI

Ref: MMR/RAL/Q/24/126

Date: 17.08.2024

DISPUTED JOINT COAL SAMPLES ANALYSIS REPORT PERTAINING TO STPP/JAIPUR & SRP CHP(SRIRAMPUR) FOR THE MONTH OF JULY-2024

DECLARED GRADE: " G10 - CRR "

Sl. No.	Particulars	SAP Sample NO	Date of Loading	RR.NO	Quantity (T)	SCCL RESULTS				STPP RESULTS				FINAL RESULTS			
						Moi%	Ash%	GCV K.Cal/Kg	Gr	Moi%	Ash%	GCV K.Cal/Kg	Gr	Moi%	Ash%	GCV K.Cal/Kg	Gr
1	SRP/CHP/STPP/07/24/97	76544	01.07.24	461002522	3761.34	5.59	36.50	4340	G10	5.63	35.56	4259	G11	5.74	36.02	4369	G10
2	SRP/CHP/STPP/07/24/98	76584	02.07.24	461002523	3768.62	5.66	35.42	4386	G10	5.64	35.26	4293	G11	5.59	35.27	4375	G10
3	SRP/CHP/STPP/07/24/101	76698	04.07.24	461002528	3763.54	5.60	36.14	4341	G10	5.66	35.87	4287	G11	5.94	37.49	4236	G11
4	SRP/CHP/STPP/07/24/103	76815	06.07.24	461002531	3771.86	5.59	36.43	4341	G10	5.65	35.37	4297	G11	5.55	36.25	4388	G10
5	SRP/CHP/STPP/07/24/106	76954	09.07.24	461002535	3717.34	5.63	35.98	4359	G10	5.6	38.38	3997	G12	5.39	39.61	3991	G12
6	SRPCHP/STPP/07/24/109	77131	12.07.24	461002539	3771.68	5.69	35.26	4391	G10	5.64	35.37	4294	G11	5.87	34.59	4398	G10
7	SRPCHP/STPP/07/24/111	77230	14.07.24	461002542	3784.42	5.59	36.51	4346	G10	5.67	38.90	3981	G12	5.55	40.28	3966	G12
8	SRP/CHP/STPP/07/24/113	77527	16.07.24	441000187	3786.66	5.66	35.45	4391	G10	5.68	38.16	3992	G12	5.69	35.61	4350	G10
9	SRP/CHP/STPP/07/24/116	77775	20.07.24	461002547	3782.28	5.59	36.03	4359	G10	5.73	35.80	4296	G11	5.80	34.09	4412	G10
10	SRP/CHP/STPP/07/24/118	77777	23.07.24	461002548	3777.68	5.68	35.35	4347	G10	5.84	35.14	4296	G11	5.63	36.25	4333	G10
11	SRP/CHP/STPP/07/24/120	77876	26.07.24	461002551	3780.86	5.66	35.59	4377	G10	5.76	38.63	3968	G12	5.84	40.16	3972	G12
12	SRP/CHP/STPP/07/24/121	77893	27.07.24	461002552	3777.26	5.59	36.40	4354	G10	5.64	35.52	4292	G11	5.55	37.99	4168	G11
13	SRP/CHP/STPP/07/24/122	78007	28.07.24	461002553	3775.92	5.65	35.63	4395	G10	5.67	39.23	3939	G12	5.74	39.64	3966	G12
14	SRP/CHP/STPP/07/24/123	78105	30.07.24	461002554	3780.44	5.70	34.84	4417	G10	5.63	36.15	4293	G11	6.03	35.23	4355	G10
15	SRP/CHP/STPP/07/24/124	78122	31.07.24	461002555	3785.96	5.67	35.31	4391	G10	5.69	36.11	4294	G11	5.77	36.33	4271	G11

Dy.GM(Coal Quality)
STPP

Supdt.(AS)
STPP

Addl. Manager(QM)
SRPArea

Jr.Scientific Officer,
Reg. Analytical Lab MM

THE SINGARENI COLLIERIES COMPANY LIMITED
(A Government Company)
REGIONAL ANALYTICAL LABORATORY, MANDAMARRI.

Ref: MMR/RAL/Q/24/ 1263

Date: 17.08.2024

DISPUTED JOINT COAL SAMPLES ANALYSIS REPORT PERTAINING TO STPP/JAIPUR & SRP OCP(SRIRAMPUR) FOR THE MONTH OF JULY-2024

DECLARED GRADE: " G10 - CRR "

Sl. No.	Particulars	SAP Sample NO	Date of Loading	RR.NO	Quantity (T)	SCCL RESULTS				STPP RESULTS				FINAL RESULTS			
						Mol%	Ash%	GCV K.Cal/Kg	Gr	Mol%	Ash%	GCV K.Cal/Kg	Gr	Mol%	Ash%	GCV K.Cal/Kg	Gr
1	SRP/OCP/STPP/07/24/49-G10	77272	10.07.24	461002661	3672.34	5.59	36.10	4339	G10	6.16	35.69	4261	G11	6.09	37.45	4275	G11

Dy.GM(Coal Quality)
STPP

Supdt.(AS)
STPP

Addl. Manager (QM)
SRPArea

Jr.Scientific Officer,
Reg. Analytical Lab MM

(72)

THE SINGARENI COLLIERIES COMPANY LIMITED
(A Government Company)
REGIONAL ANALYTICAL LABORATORY MANDAMARRI

Ref: MMR/RAL/Q/24/ 1254

Date: 16-08-24

STPP JOINT COAL SAMPLES ANALYSIS RESULTS EXCHANGE FOR THE PERIOD FROM 01.07.24 TO 31.07.2024

BPA GOLETI CHP TO M/s. SINGARENI THERMAL POWER PLANT (JAIPUR)

DECLARED GRADE: " G10 - CRR "

Sl. No.	Particulars	SAP Sample NO	Date of Loading	RR.NO	Quantity (T)	SCCL RESULTS				STPP RESULTS				Final Grade	Total Moist %
						Moi%	Ash%	GCV K.Cal/Kg	Gr	Moi%	Ash%	GCV K.Cal/Kg	Gr		
1	BPA/GLT/STPP/07/24/01-G10	78639	11.07.24	461001124	3789.86	10.85	27.49	4348	G10	5.68	36.09	4304	G10	G10	15.65

1 No. of samples exchanged : 1 (One only)
2 Disputed samples : 0 (Zero)
3 Agreed samples 'G10' grade : 1 (One only)
3 Agreed samples 'G11' grade : 0 (Zero)
4 Agreed samples 'G12' grade : 0 (Zero)
4 Agreed samples 'G13' grade : 0 (Zero)

Dy.GM(Coal Quality)
STPP

Supdt.(AS)
STPP

Incharge(Quality)
BPA Area

Jr.Scientific Officer,
Reg. Analytical Lab MM

Monthwise details of credit or debit adjustments of STPP from SCCL for FY 2024-25 (Rs.Crores)		
Month	**Credit note**	**Debit Note**
Apr-24	-5.12	-
May-24	-13.65	-
Jun-24	-10.27	-
Jul-24	-4.84	-
Aug-24	-8.31	-
Sep-24	-27.27	-
Oct-24	-21.18	7.14
Nov-24	-18.19	-
Dec-24	-14.56	-
Jan-25	-18.06	-
Feb-25	-18.93	-
Mar-25	-21.58	-
Total	**-181.97**	**7.14**

Note: Credit and debit adjustments based on the joint sampling are fully passed through in the Energy Charge rates (ECR) computation in the respective months.
It is to submit that negative credit notes results in reduction of coal cost and Energy charges. Accoridng to above table net benefit received by TGDISCOMs for grade slippages is Rs. 174.84 crores for FY 2024-25 based on joint sampling reports.

MANDATORY ENERGY AUDIT REPORT

FOR

SINGARENI THERMAL POWER PLANT (2 X 600 MW)

DC REGISTRATION NUMBER:TPP0217TS

PEGADAPALLY VILLAGE, JAIPUR, MANCHERIAL DIST, TELANGANA STATE PIN – 504216.

CONDUCTED BY

NIN ENERGY INDIA PRIVATE LIMITED
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Ponniamman Koil Street, Kottur, Chennai-600085,
Tamilnadu, India
Tel: 044 24455223 EMAILS: info@ninenergy.com

JANUARY 2024

1 Acknowledgement

NIN Energy India Private Limited (NEIPL) would like to express sincere thanks to **SINGARENI THERMAL POWER PLANT (2 X 600 MW)** for giving the opportunity to carry out Mandatory Energy Audit at **PEGADAPALLY VILLAGE, JAIPUR, MANCHERIAL DIST, TELANGANA STATE PIN – 504216.** Audit conducted at **SINGARENI THERMAL POWER PLANT (2 X 600 MW)** from **22.01.2024 to 27.01.2024.**

NEIPL acknowledges with thanks the co-operation and the support extended by all **Staff** of **SINGARENI THERMAL POWER PLANT (2 X 600 MW)** for carrying out MEA audit.

We would also like to place on record our sincere thanks and appreciation to following officials from **SINGARENI THERMAL POWER PLANT (2 X 600 MW** for the successful conduct of the audit and all other supporting staff of **SINGARENI THERMAL POWER PLANT (2 X 600 MW** who have given full co-operation and support during the audit.

Name	Designation
Mr. P.C Basivi Reddy	ED STPP
Mr. J. N. Singh	Chief (O&M), STPP
Mr. K Siva Prasad	DGM Operation (C&I)
Mr. K. Santosh Kumar	DGM Operation (Electrical)
Mr. P. Veera Brahmam	DGM (S & EM)
Mr. L J V Subbarao	SE (Analytical)

For NIN ENERGY INDIA PRIVATE LIMITED

(B. SENTHILKUMAR)
ACCREDITED ENERGY AUDITOR -AEA 023

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List of Abbreviations used in this report.

Description	Abbreviations
AHP	Ash handling plant
AP	Auxiliary power (MW or MWh for a time period)
APH	Air pre-heater
BFP	Boiler feed pump
C&I	Control and instrumentation
CA	Chemical Analysis
CEP	Condensate extraction pump
CHP	Coal handling plant
COH	Capital overhaul
CT	Current transformers
CWP	Cooling water Pump
DC	Direct current
DCS	Distributed control system
Deg C	Degree Celsius
ESP	Electrostatic precipitator
ESV	Emergency stop valve
FDF	Forced draft fan
FO	Furnace oil
GCV	Gross Calorific value (kCal/kg)
HP	High Pressure
HPT	High pressure turbine
Hrs	Hours
HT	High tension (6.6kVand above)
HV	High voltage
HZ	Frequency
IBR	Indian Boiler Regulation
ID	Inside diameter
IDF	Induced draft Fan
INR	Indian rupees
IP	Intermediate Pressure
IPT	Intermediate Pressure turbine
KPI	Key performance indicators
LDO	Light diesel oil
LP	Low pressure
LPT	Low pressure turbine
LT	Low-tension (415 V)
Max	Maximum
MCR	Maximum continuous rating of the unit
MS	Main steam
MW	Mega watt
NRV	Non-return valve

Description	Abbreviations
O&M	Operation and maintenance
OEM	Original equipment manufacturer
PAF	Primary air fan
PLF	Plant load factor (%)
RH	Reheat
SEC	Specific Energy consumption (kWh/t)
SFC	Specific coal consumption (kg/kWh=t/MWh)
SH	Super heater
SHR	Station heat rate (kCal/kWh)
T/hr	Tonne per hour
TPH	Tonne per hour
UAT	Unit auxiliary Transformer
UHR	Unit heat rate (kCal/kWh)
V	Velocity (m/s)
VFD	Variable Frequency Drive

2 Executive summary

2.1 Company's profile

Singareni Collieries Company (SCCL), a government-owned coal mining company, was established in 1920 under the Hyderabad Companies Act. The company is jointly owned by the Telangana government (51%) and the Union Government (49%). It was named after the village of Singareni in the Bhadradri Kothagudem district of Telangana State.

In the year 1871, the state's first coal reserves were discovered in Singareni village near Yellandu by Dr. William King of the geological Survey of India during the British era. In 1889 Hyderabad Deccan company Limited incorporated in England and stocks were traded in London Stock Exchange and coal mining started. On 23 December 1920 coal mining operations transferred to the new company and renamed as Singareni Collieries Company Limited and the day is celebrated as Singareni day in the company every year. In 1945 Nizam of Hyderabad took over, thus Singareni became the first government managed company. In 1960 Government of India participated with 49% equity.

SCCL now operates 18 open-pit mines and 29 underground mines across 5 Telangana districts: Bhadradri Kothagudem, Khammam, Jayashankar Bhupalpally, Ramagundam, and Mancheriyal. The Company produced 61.34 million Tonnes (MT) of coal in the year 2016-17 and 62.01 MT in the year 2017–18. SCCL purchases about 60 MU (Million units) power from the state distribution companies.

Mr. N. Balaram, Singareni Collieries Chairman and managing director expects STPP to bring down the deficit in power generation in Telangana State. Under his leadership Mr. P. C. Basivi Reddy, Executive director (Power Projects) is currently leading the power plant operations and future expansion.

2.2 Summary and classification of energy

Water for the plant consumptive requirements is sourced from two different locations, one from Godavari River at Shetpalli Village 9 km away and second is Pranhita River near Devalwada village which is 42 kms away from the plant. Primary source of fuel is coal and is sourced from Srirampur coal fields owned by SCCL, which is at a distance of 11km.

2.3 Conservation measures - Attached in Form 2

Please refer Form-2 for the Energy Conservation Measures.

3 Introduction about the plant/establishment

3.1 General plant/establishment details and descriptions

The Singareni Thermal Power Plant

The Singareni Thermal Power Plant (STPP) is a coal based Sub-critical power station in Pegadapalli, Telangana, India having total installed capacity of 1200 MW, consisting of two identical 600 MW units, and is operated by the Singareni Collieries Company Limited
Power plant synchronization was completed on 13 March 2016 for Unit 1 and on 01 June 2016 for Unit 2. Stage I of the power plant project was completed with Unit 1 being commissioned on 25 September 2016 and Unit 2 on 2 December 2016.

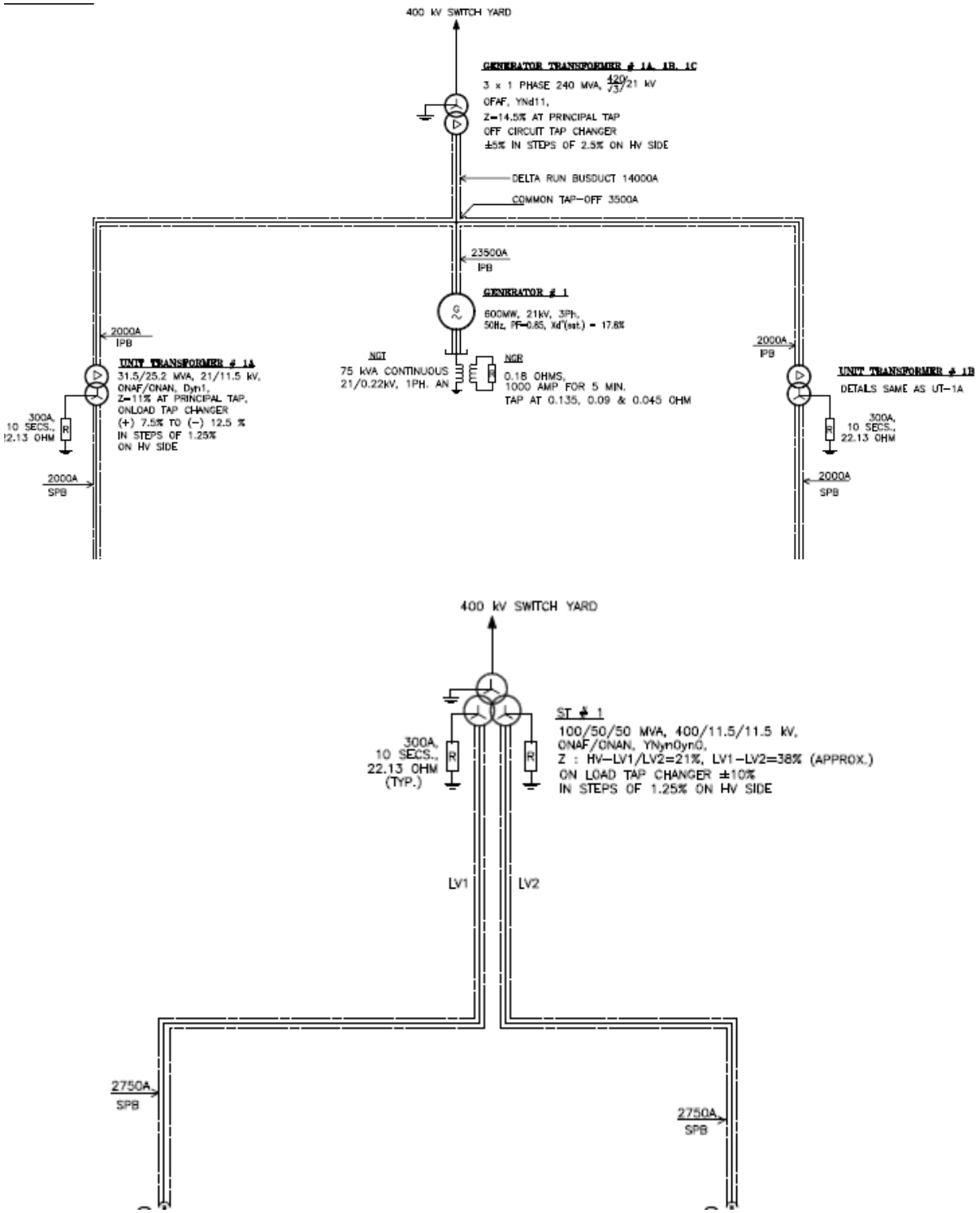
3.2 Energy Audit Team

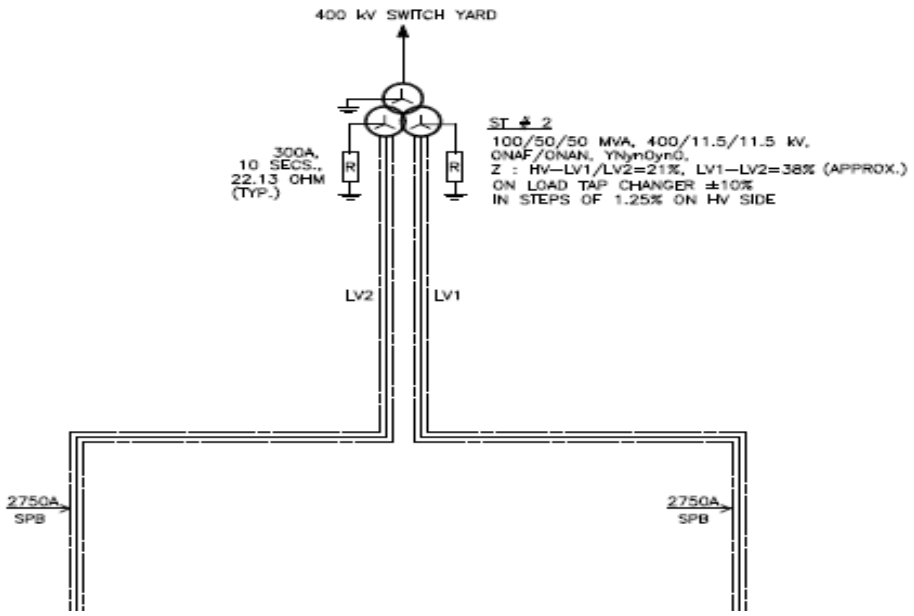
Energy audit team comprises of Accredited Energy Auditor, Certified Energy Auditor, sector Expert and Graduate Engineers.

S. No	Name	Role
1	B. SENTHIL KUMAR	ACCREDITED ENERGY AUDITOR
2	K. BALASUBRAMANIYAN	TPP SECTOR EXPERT AND CERTIFIED ENERGY AUDITOR
3	T. KARTHIKEYAN	CERTIFIED ENERGY AUDITOR
4	S. SENTHAMIL SELVAN	ENGINEER
5	M.ABILASH	ENGINEER

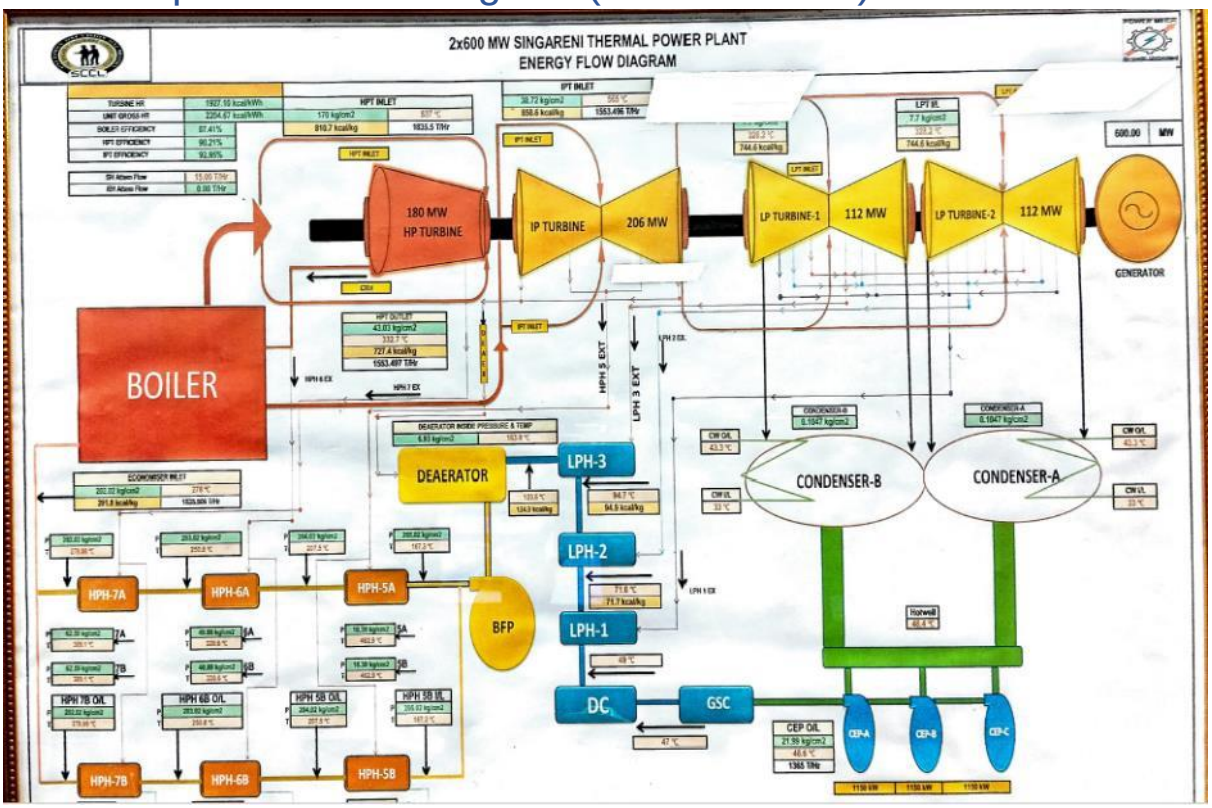
3.3 Brief description of Electricity Generation and Energy Utilization and Export.

The plant generates a voltage of 21 kV and exports the power to grid through 400 kV substation.





4 Detailed process flow diagram (Unit overview)



5 Performance evaluation of major utilities and process equipment/systems.

5.1 Boiler description

STPP 2x600 MW units has Boiler for steam generation with the following details:

	CONTRACT DATA SHEET CONTRACT No. 1620, 1621					Contract Date: November 2011		
PURCHASER	THE SINGARENI COLLIERIES COMPANY LIMITED							
PLANT NAME	SINGARENI TPP, 2 x 600MW			CONSULTANT NTPC LIMITED		Utility		
PROPOSED FUEL	Sub-Bituminous coal				Ash IDT	HHV Kcal / kg	Grindability (HGI)	
FC% 33.71	Vol% 27.95	H2O% 7.62	Ash% 30.72	S% 0.42	1400°C	4529	52	
FUEL BURNING EQUIPMENT								
TYPE	Main Burners: Tilting Tangential		Stabilisation Burners: Tilting Tangential		WILLS	Type: XRP 1043		
MAKE & NOS.	BHEL, 32		BHEL, 16			Make & Nos: BHEL 8		
CONTROL	Air Damper		Air Damper			Capacity: 73.6 t/h		
CAPACITY	60 X 10^6 Kcal/hr.		34 X 10^6 Kcal/hr.			Motor KW : 680 Speed (RPM): 1000		
DISPOSITION	Corners		Corners			System: Cold PA		
FURNACE	Type: Balanced Draft Furnace With Fusion Welded Water Walls							
WIDTH 20701 mm		DEPTH 18147 mm			Volume m^3 : 22319 Fuel Heat Input 1406.1 x 10^6 Kcals/hr			
BOILER	Controlled Circulation With Rifled Tubing,(cc+), Radiant Reheat, Dry Bottom, Top Supported				Pressure	Drum Design 210 Kg/cm^2(g)		
DESIGNATION: $\frac{20701}{18147}$ $\frac{325-51}{267-51}$ CC+						Super heater outlet: 178.0 kg/cm^2 (g)-BMCR		
SUPER HEATER	Stage: I Type: LTSH Horizontal and Pendant				H. S. Area m^2	14923		
Total H.S. m^2 18928	Stage: II Type: SH division Panellette (Plate Projected)					1805		
	Stage: III Type: SH Finish Platen (Plate Projected)					2200		
ATTEMPERATOR	Type: Spray		No.of Stages: Single stage			Medium of Spray : Feed Water		
REHEATER	Type: Radiant Front platen, Rear pendant.		Total: H.S m^2 10200			Control: Burner Tilt and Excess Air		

5.1.1 Coal analysis

To conduct performance study on boilers the coal used for firing was analysed as fired basis and the readings are tabulated.

Chemical properties of Fuel Used				
Fuel Parameters – Ultimate Analysis derived from Proximate analysis				
Ultimate Analysis		Design	Unit-1	Unit-2
Carbon	%	49.41	41.17	41.22
Hydrogen	%	2.83	2.88	2.97
Sulphur	%	0.42	0.5	0.5
Nitrogen	%	0.85	1.56	1.53
Oxygen	%	7.96	10.94	11.29
Total moisture	%	7.62	8.64	8.95
Ash	%	30.72	34.3	33.54
Gross calorific value	Kcal/kg	4529	4116	4128
Fuel Parameters – Proximate Analysis				
Fixed Carbon	%	35	30.14	29.17
Volatile matter	%	25.6	26.82	28.34
Total moisture	%	11	8.64	8.95
Ash	%	30.72	34.3	33.54
Ash Analysis (Bottom / Fly) 25/75				
Unburnt in Ash				
Carbon content in fly ash	%	--	0.35	0.33
Carbon content in bottom ash	%	--	2.39	2.12

5.1.2 Boiler Efficiency by Indirect Method

To find the boiler efficiency Parameters of STPP Boilers are collected and tabulated as below to evaluate the boiler performance by indirect method.

Sl. No.	Parameters	Unit	Design	Unit-1	Unit-2
1	Date		24.01.2024		
2	Duration	Hr	2 hours		
3	Avg. Unit load	MW	600	599.53	601.83
4	% of unit TMCR	%	100%	99.92	100.38
5	Frequency	Hz	50	50	50
6	Main steam flow	TPH	1835	1897.65	1843.51
7	% of Boiler MCR	%	91.75	94.88	92.18
8	Main steam pressure	kg/cm^2	176.6	167.68	168.865
9	Main steam temperature	^OC	540	542.90	543.05
10	Coal consumption	T/Hr	375	343.97	359.73
11	Ambient parameters				
12	Dry bulb temperature	^OC	27	29.00	29.00
15	Moisture content in the air	kg/kg of air	0.013	0.018	0.018
17	Oxygen content in Flue Gas after Economiser	%	3.53	3.735	3.355
18	Flue Gas Temperature after APH (Corrected)	^OC	138	149.36	137.89
19	Ambient air Temp	^OC	27	29	29

Derived Parameters to calculate Dry FG Loss					
Sl. No	Description	Units	Design	Boiler-1	Boiler-2
1	Stochiometric air	kg/kg	6.38841	5.32393	5.34474
2	Excess Air Supplied in %	%	20.21	21.63	19.01
3	Excess air in wt.	kg	1.29085	1.15174	1.01624
4	Actual Air Supplied in Kg of air/Kg of Fuel	kg/kg	7.67926	6.47567	6.36099
5	Total Mass of Flue Gas	kg/kg	8.35	7.13	7.00
Boiler Combustion losses					
1	Loss due to Dry Flue Gas	%	5.04	5.00	4.43
2	Loss due to formation of H2O from H2 in Fuel	%	3.44	4.02	4.10
3	Loss due to moisture in Fuel	%	1.04	1.34	1.37
4	Loss due to moisture in air	%	0.12	0.15	0.14
5	Loss due to Sensible heat in BA & FA	%		0.66	0.64
6	Loss due to Mill Rejects	%		0.10	0.10
7	Loss due to unburnt in Bottom Ash	%	1.00	0.40	0.35
8	Loss due to unburnt in Fly Ash	%		0.18	0.16
9	unaccounted loss & Manufacturer margin	%	0.59	0.59	0.59
10	Loss due to radiation *	%	0.24	0.24	0.23
11	Total Loss	%	11.47	12.68	12.11
12	Boiler Efficiency %	%	**88.53**	**87.32**	**87.89**

From the above the following observations are furnished.

- ✓ The Boiler efficiency is evaluated by indirect method/ loss calculation method by calculating various losses like dry flue gas loss, loss due to hydrogen, moisture present in the fuel, loss due to moisture present in the air and other losses and assumption as per the OEM.
- ✓ The boiler's performance is satisfactory. The variation of Boiler efficiency by 0.5 % due to variation in the H2 content of the fuel.

5.1.3 Performance of Economizers

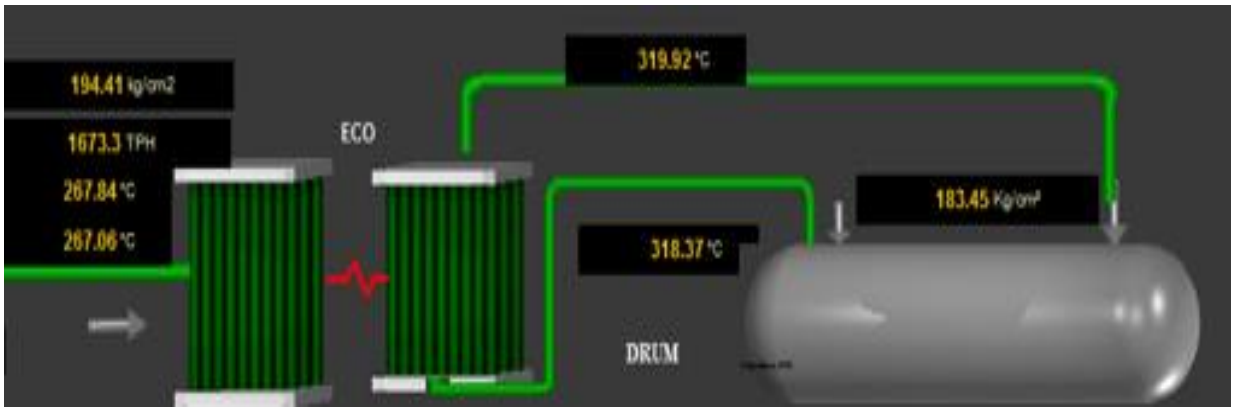
Economiser

Economiser in boiler serves to recover waste heat from the flue gas after super heater panels in boiler.

In STPP Boiler (600 MW) Economizers are used in the flue gas path with following details

Type – Plain type.

ECONOMISER	Type: Plain Tube	Total H.S. m^2 : 21600	No. of Blocks: 3



The performance study of Economiser of STPP Boiler 600MW

As part of Boiler performance Test, Economiser Performance Test was conducted, and the outcomes are tabulated.

Sl. No	Parameters	Unit	Design	Unit-1	Left	Right
1	Date		24.01.2024			
2	Duration	Hr	2 Hours			
3	Avg. Unit load	MW	600	599.53		
4	% of MCR	%	100	99.92		
5	Frequency	Hz	50	50		
6	Main steam flow	T/Hr	1835.5	1897.65		
8	Main steam Temp	^{O}C	540	542.9	542.94	542.86
9	Feed water flow	T/Hr	1820.5	1746.03	873.015	873.015
10	FW inlet Temp	^{O}C	278	278.73	278.73	278.73
11	FW outlet Temp	^{O}C	321	325.56	325.81	325.30
12	Flue gas inlet Temp	^{O}C	486	454.37	452.42	456.32
13	Flue gas outlet Temp	^{O}C	335	347.39	346.89	347.88
14	FW Temp gain	^{O}C	43	46.83	47.08	46.57
15	Heat Pickup in Eco	MkCal/Hr	78.28	81.76	41.10	40.66
16	Effectiveness	%	20.67	26.66	27.11	26.22
17	LMTD	^{O}C	101.61	95.60	94.39	96.81

Remarks: The performance of Economiser (Left and Right) of Boiler-1 is satisfactory.

As part of Boiler performance Test, Economiser Performance Test was conducted, and the outcomes are tabulated.

Sl. No	Parameters	Unit	Design	Unit-2	Left	Right
1	Date		24.01.2024			
2	Duration	Hr	2 Hours			
3	Avg. Unit load	MW	600	601.83		
4	% of MCR	%	100	100.31		
5	Frequency	Hz	50	50		
6	Main steam flow	T/Hr	1835.5	1843.51		
8	Main steam temperature	^{O}C	540	543.045	543	543.09
9	Feed water flow	T/Hr	1820.5	1698.44	849.22	849.22
10	FW inlet Temp	^{O}C	278	268.00	268.00	268.00
11	FW outlet Temp	^{O}C	321	319.42	320.17	318.66
12	Flue gas inlet Temp	^{O}C	486	454.60	467.71	441.48
13	Flue gas outlet Temp	^{O}C	335	348.75	354.73	342.77
14	FW Temp gain	^{O}C	43	51.42	52.17	50.66
15	Heat Pickup in Eco	MkCal/Hr	78.28	87.33	44.30	43.02
16	Effectiveness	%	20.67	27.55	26.12	29.20
17	LMTD	^{O}C	101.61	105.64	114.46	96.82

Remarks: The performance of Economiser (Left and Right) of Boiler-2 is satisfactory.

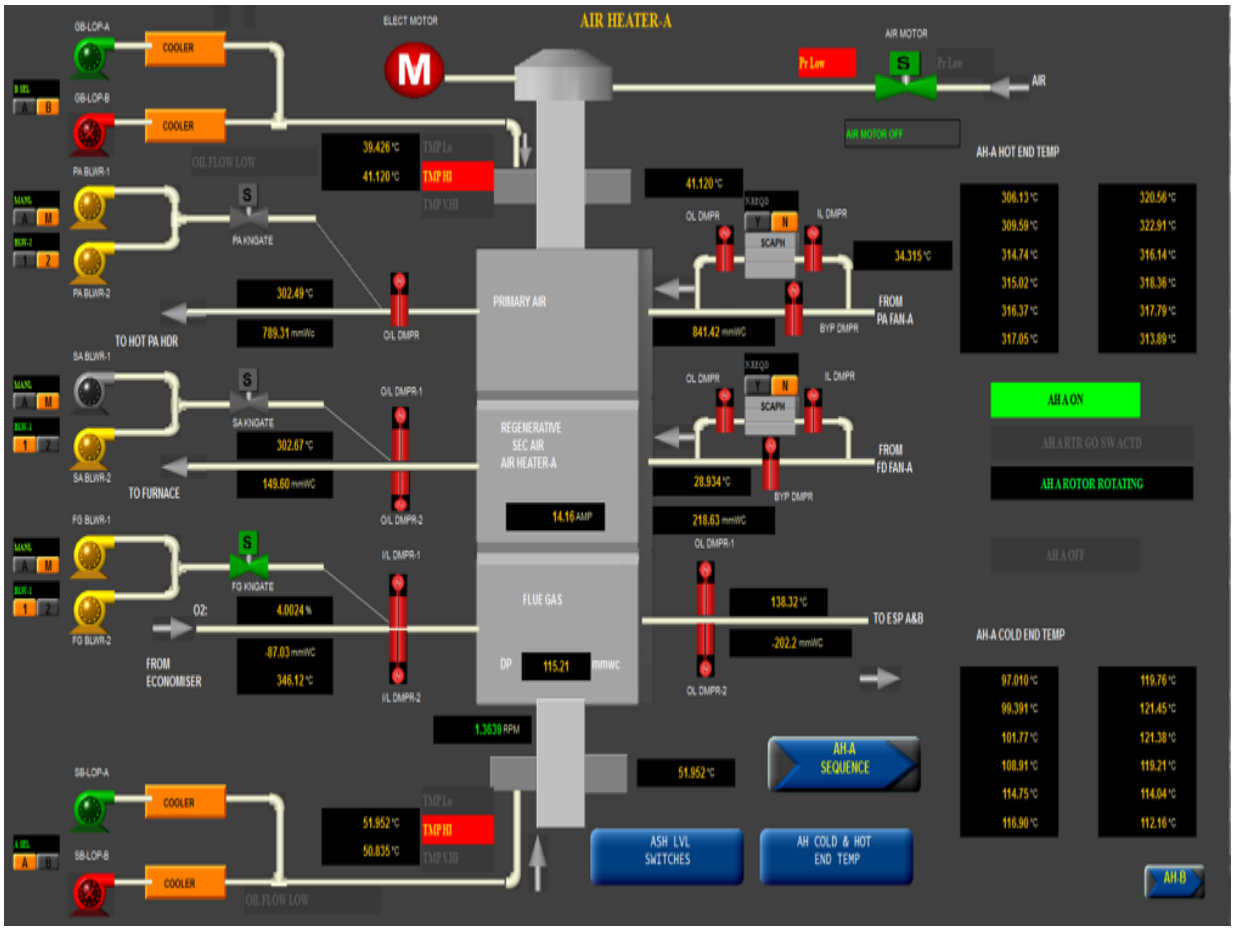
5.1.4 Draft system and APH

5.1.5 Air Preheater

Regenerative Air Pre Heater in boiler serves to recover waste heat from the flue gas after Economiser in boiler.

In STPP Boiler (600 MW) Regenerative Air Pre Heaters are used in the flue gas path with following details

AIR HEATER	Type: Tri–Sector Size: 32.5 VIMT 2000 (50 deg PA)	Total HS per boiler m² : 101400	Motor kw : 30
		Nos. TWO (2)	Make : BHEL



As part of the Boiler Performance study, performance of Air Pre Heaters (APH) was evaluated and shown below.

a) Air Pre Heater performance parameters of STPP Boiler-1 (600MW)

Sl. No	Parameters	Unit	Design	MEA Test	Left	Right
1	Date		24.01.2024			
2	Duration	Hr	2 hours			
3	Avg. Unit load	MW	600	599.53		
4	% of unit MCR	%	100%	99.92		
5	Frequency	Hz	50	50		
6	Coal consumption	T/Hr	289	343.97		
7	Primary air	T/Hr	372	429.18	214.588	214.588
8	secondary air APH outlet	T/Hr	1293	1541.57	767.79	773.78
9	Total Air Flow to APH	T/Hr	1665	1970.75	982.378	988.368
10	Ambient air temperature	^{O}C	27	29.00	29.00	29.00
11	Flue Gas Temp @ APH inlet	^{O}C	335	347.385	347.88	346.89
12	Flue Gas Temp @ APH outlet	^{O}C	128.7	131.925	125.96	137.89
14	O2 at APH inlet	%	3.53	3.735	3.85	3.62
15	O2 at APH outlet	%	5.123	5.47	5.7	5.23
16	Primary air Temperature at APH inlet	^{O}C	27	34.04	34.17	33.91
17	Secondary air Temperature at APH inlet	^{O}C	27	28.50	28.59	28.4
18	Primary air Temperature at APH outlet	^{O}C	311	303.78	302.2	305.35
19	Secondary air Temperature at APH outlet	^{O}C	315	304.84	302.28	307.39
20	Primary air Diff. pressure across APH	mmWC	44	64.60	66.79	62.41
21	Secondary air Diff. pressure across APH	mmWC	45	64.98	62.95	67
22	Flue Gas Diff. pressure across APH	mmWC	91	138.12	133.47	142.77
23	weighted average of air inlet temp	^{O}C	27.00	29.70	29.81	29.60
24	weighted average of air outlet temp	^{O}C	314.11	304.60	302.26	306.95

Air Pre Heater-Performance test results of STPP Boiler-1 (600MW)

Air Pre Heater-Performance Test results are shown in the tabulation.

Sl. No	Parameters	Unit	Design	Unit-1
1	LOAD	MW	600	599.53
2	Effectiveness of APH Left	%	92.99	85.66
3	Effectiveness of APH Right	%	92.99	87.41
4	Heat picks up	MkCal/Hr	115.59	131.00
5	AH Leakage (Left)	%	10.03	12.09
6	AH Leakage (Right)	%	10.03	10.21
7	AH Leakage	%	10.03	11.15
8	EFGT - corrected to AH Leakage	^{O}C	138.39	149.36
9	AH Gas side Efficiency	%	66.98	67.82
10	Air side Efficiency	%	93.22	86.53
11	AH X Ratio	Ratio	0.72	0.78
12	DP across AH Primary Air Side	mm wcl	44.00	64.60
13	DP across AH secondary Air Side	mm wcl	45.00	64.98
14	DP across AH FG side	mm wcl	91.00	138.12
15	FG Exit temp APH I/L	^{O}C	335.00	347.39
16	Primary Air Temperature APH O/L	^{O}C	311.00	303.78
17	Secondary Air Temperature APH O/L	^{O}C	315.00	304.84

Remarks:

- ✓ AH leakage left & right is12.09 % & 10.21% (avg 11.15 %) which is higher than the design value.
- ✓ Air side efficiency is less than the design value and hence the x-ratio is more than design.
- ✓ The reason may be the quantity of PA to APH is more than the design value.
- ✓ It is suggested to attend the radial and axial seal during shut down of the Unit.
- ✓ APH Leakage over and above the design is quantified as 45 T/Hr.
- ✓ The energy saving potential is discussed in the Encon section.
- ✓ It is suggested for basket water washing during the shutdown.
- ✓ Baskets may be changed if warranted.
- ✓ Axial and radial seals may be changed during shutdown.

b) Air Pre Heater performance parameters of STPP Boiler-2 (600MW)

Sl. No	Parameters	Unit	Design	MEA Test	Left	Right
1	Date		24.01.2024			
2	Duration	Hr	2 hours			
3	Avg. Unit load	MW	600	599.53		
4	% of unit MCR	%	100%	99.92		
5	Frequency	Hz	50	50		
6	Coal consumption	T/Hr	289	343.97		
7	Primary air	T/Hr	372	429.18	214.588	214.588
8	secondary air APH outlet	T/Hr	1293	1541.57	767.79	773.78
9	Total Air Flow to APH	T/Hr	1665	1970.75	982.378	988.368
10	Ambient air temperature	^{O}C	27	29.00	29.00	29.00
11	Flue Gas Temp @ APH inlet	^{O}C	335	347.385	347.88	346.89
12	Flue Gas Temp @ APH outlet	^{O}C	128.7	131.925	125.96	137.89
14	O2 at APH inlet	%	3.53	3.95	4.26	3.63
15	O2 at APH outlet	%	5.123	5.84	5.82	5.86
16	Primary air Temperature at APH inlet	^{O}C	27	34.04	34.17	33.91
17	Secondary air Temperature at APH inlet	^{O}C	27	28.50	28.59	28.4
18	Primary air Temperature at APH outlet	^{O}C	311	303.78	302.2	305.35
19	Secondary air Temperature at APH outlet	^{O}C	315	304.84	302.28	307.39
20	Primary air Diff. pressure across APH	mmWC	44	64.60	66.79	62.41
21	Secondary air Diff. pressure across APH	mmWC	45	64.98	62.95	67
22	Flue Gas Diff. pressure across APH	mmWC	91	138.12	133.47	142.77
23	weighted average of air inlet temp	^{O}C	27.00	29.70	29.81	29.60
24	weighted average of air outlet temp	^{O}C	314.11	304.60	302.26	306.95

Air Pre Heater-Performance Test results are shown in the tabulation.

Sl. No	Parameters	Unit	Design	Unit-2
1	LOAD	MW	600	599.53
2	Effectiveness of APH Left	%	92.99	79.02
3	Effectiveness of APH Right	%	92.99	85.39
4	Heat picks up	MkCal/Hr	115.59	132.05
5	AH Leakage (Left)	%	10.03	9.24
6	AH Leakage (Right)	%	10.03	13.28
7	AH Leakage	%	10.03	11.26
8	EFGT - corrected to AH Leakage	^{O}C	138.39	137.89
9	AH Gas side Efficiency	%	66.98	70.26
10	Air side Efficiency	%	93.22	82.14
11	AH X Ratio	Ratio	0.72	0.86
12	DP across AH Primary Air Side	mm wcl	44.00	126.49
13	DP across AH secondary Air Side	mm wcl	45.00	87.12
14	DP across AH FG side	mm wcl	91.00	164.87
15	FG Exit temp APH I/L	^{O}C	335.00	348.75
16	Primary Air Temperature APH O/L	^{O}C	311.00	287.14
17	Secondary Air Temperature APH O/L	^{O}C	315.00	293.67

Remarks:

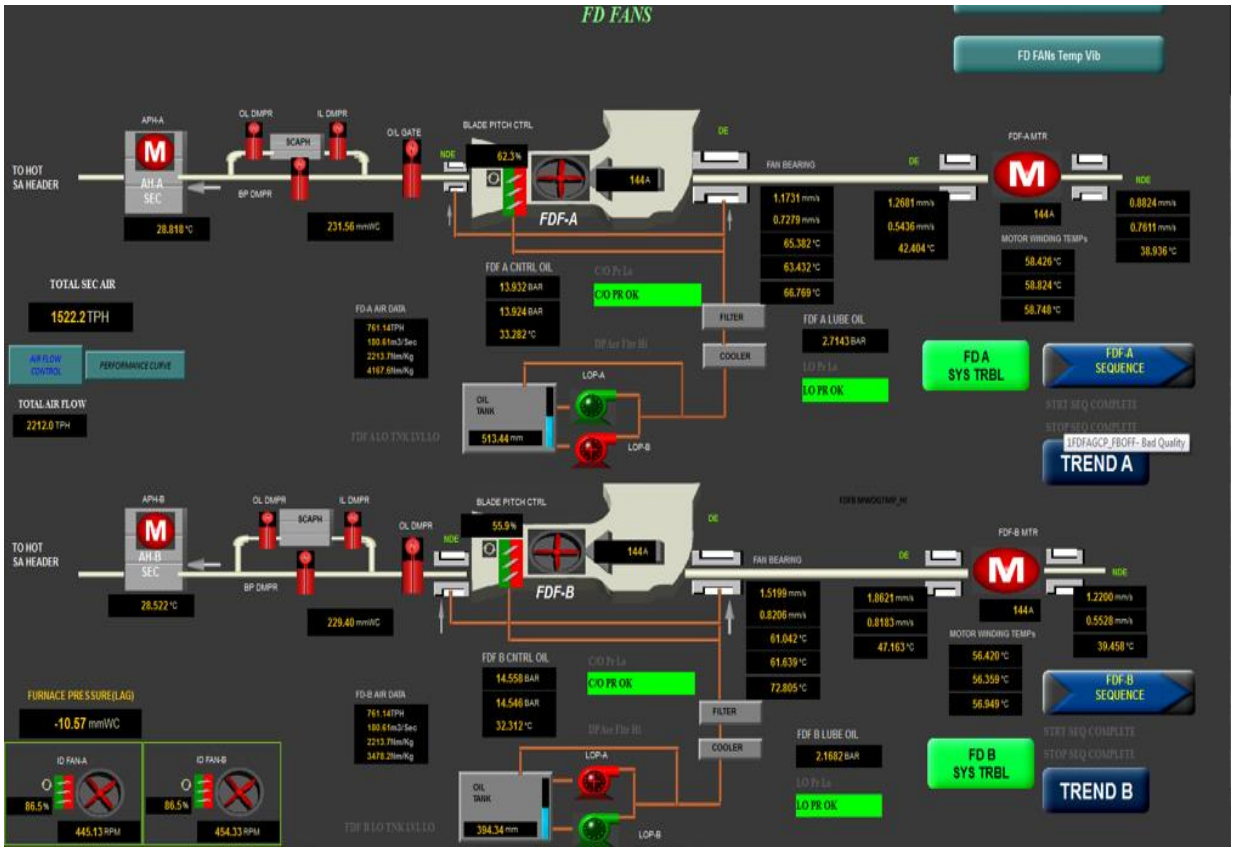
- ✓ AH leakage left & right is9.24 % & 13.28% (avg 11.26 %) which is higher than the design value.
- ✓ Air side efficiency is less than the design value and hence the x-ratio is more than design.
- ✓ Reason may be the quantity of PA to APH is more than the design value.
- ✓ It is suggested to attend the radial and axial seal during shut down of the Unit.
- ✓ The energy saving potential is discussed in the Encon section.
- ✓ It is suggested for basket water washing during the shutdown.
- ✓ Axial and radial seals may be inspected during shutdown.

5.1.6 Performance Assessment of FD, PA and ID fans

5.1.6.1 FORCED DRAFT FANS

Forced draft fans are the main source of air required for complete combustion and to create turbulence, to retain the combustibles till complete combustion. In STPP Boiler two numbers of FD fans with the following specifications are employed.

Make	M/s. BHEL
Type	Axial ap1-26/16.
Numbers	Two
Flow	269 M^3 /sec
Pressure	390 mm wc
Drive	Motor
Power	1350 kW
Control	Variable pitch Blade control.



MEA study on Forced Draft Fans of Boiler-1 (600 MW)

The performance assessment of FD Fan has been conducted and the operating parameters are recorded in the following table.

Sl. No	Parameters	Unit	Design	Boiler-1	
				FD Fan A	FD Fan B
1	Date			24.01.2024	
2	Duration	Min		2 hours	
3	Avg. Unit load	MW	600	599.53	
4	TMCR	%	100	99.92	
5	Frequency	Hz	50	50	
6	Total Air Flow	T/Hr	1018	767.79	773.78
7	Air Flow	M3/sec	269.00	182.91	184.34
8	Suction Pressure	mm of wc	0.00	0	0
9	Suction Temp	^{O}C	50	29	29
10	Density of Air	kg/M3	1.051	1.166	1.166
11	Discharge Pressure	mm of wc	390	232.06	228.1
12	Total Head	mm of wc	390.00	232.06	228.1
13	FD Fan Motor Rating	kW	1350	1350	1350
14	FD Fan Current	Amps	-----	146.51	146.69
15	Power Factor	Factor	-----	0.76	0.74
16	Motor Power Measured	kW	1324	636.42	620.43
17	Fan shaft power	kW	1261.38	607.78	592.51
18	Fan air Power	kW	1028.53	416.14	412.23
19	Efficiency of the Fan	%	81.54	68.5	69.6
20	Combined Efficiency	%	77.7	65.4	66.4
21	Motor Loading	%	98.07	47.14	45.96
22	Specific Energy consumption	kW/T	1.30	0.83	0.80

Remarks:

- ✓ The fan efficiency is less when compared with the design for operating parameters of the Fan.
- ✓ The lower fan efficiency is mainly due to flow and head deviation from the Fan BEP.

MEA study on Forced Draft Fans of Boiler-2 (600 MW)

The performance assessment of FD Fan has been conducted and the operating parameters are recorded in the following table.

Sl. No	Parameters	Unit	Design	Boiler- 2	
				FD Fan A	FD Fan B
1	Date			24.01.2024	
2	Duration	Min		2 hours	
3	Avg. Unit load	MW	600	599.53	
4	TMCR	%	100	99.92	
5	Frequency	Hz	50	50	
6	Total Air Flow	T/Hr	1018	744.84	723.78
7	Air Flow	M3/sec	269.00	177.44	172.43
8	Suction Pressure	mm of wc	0.00	0	0
9	Suction Temp	^{O}C	50	29	29
10	Density of Air	kg/M3	1.051	1.166	1.166
11	Discharge Pressure	mm of wc	390	232.06	228.1
12	Total Head	mm of wc	390.00	232.06	228.1
13	FD Fan Motor Rating	kW	1350	1350	1350
14	FD Fan Current	Amps	-----	163.23	167.45
15	Power Factor	Factor	-----	0.76	0.75
16	Motor Power Measured	kW	1324	709.05	717.81
17	Fan shaft power	kW	1261.38	677.14	685.51
18	Fan air Power	kW	1028.53	403.70	385.59
19	Efficiency of the Fan	%	81.54	59.6	56.2
20	Combined Efficiency	%	77.7	56.9	53.7
21	Motor Loading	%	98.07	52.52	53.17
22	Specific Energy consumption	kW/T	1.30	0.95	0.99

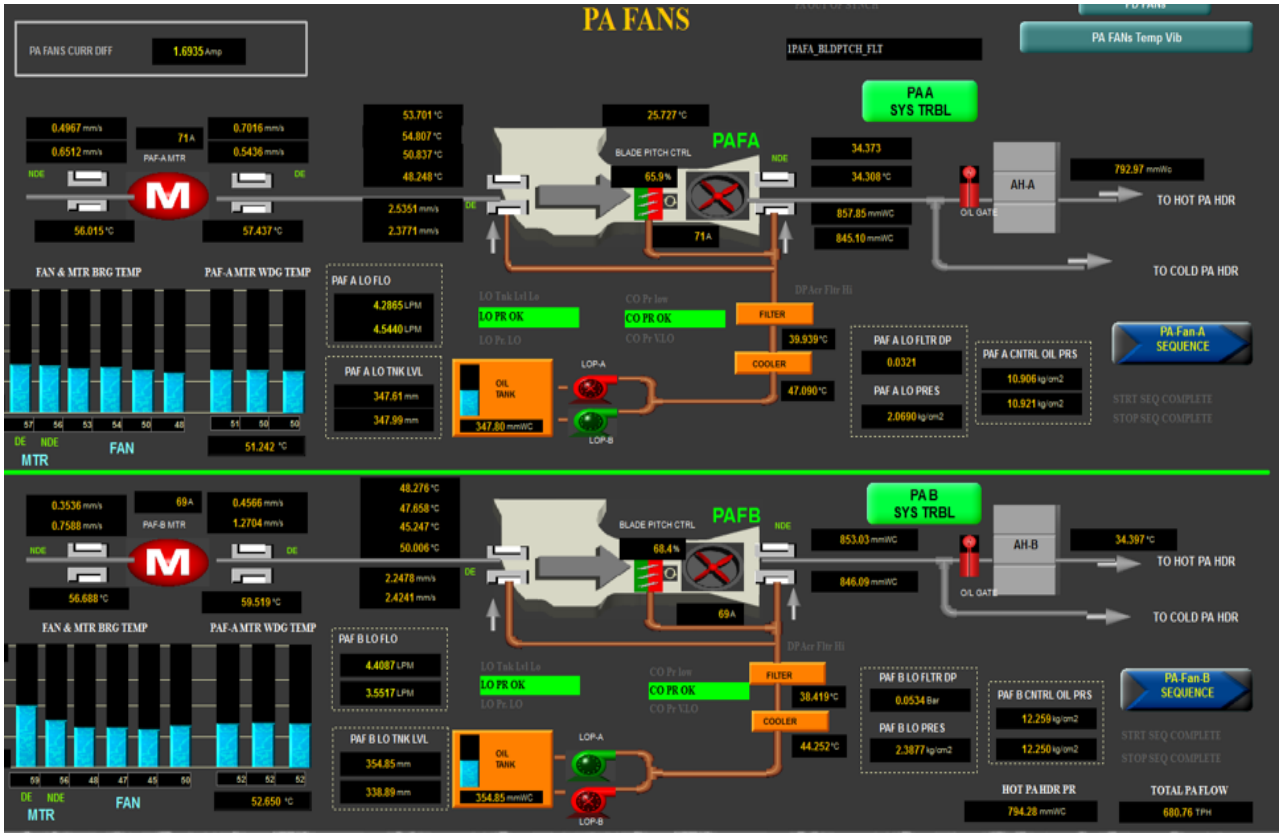
Remarks:

- ✓ The fan efficiency is less when compared with the design for operating parameters of the Fan.
- ✓ The lower fan efficiency is mainly due to flow and head deviation from the Fan BEP.

5.1.6.2 PRIMARY AIR FANS

Primary Air Pans are vital in a power plant. Hot Primary air is used for removal of moisture in the fuel as well to create differential pressure to convey the pulverized fuel to various levels of burners. Air to coal ratio is an indicator for mill performance study. The specifications of PA Fans are as below.

Make	M/s. BHEL
Type	Axial AP2-20/12
Numbers	Two
Flow	200 M^3 /sec
Pressure	1260 mm wc
Drive	Motor
Power	3200 kW
Control	Variable pitch Blade control.



MEA study on Primary Air Fans of Boiler-1(600 MW)

The performance assessment of PA Fan has been conducted and the operating parameters are recorded in the following table.

Sl. No.	Parameters	Unit	Design	MEA Test	
				PA Fan A	PA Fan B
1	Date			24.01.2024	
2	Duration	Min		2 Hours	
3	Avg. Unit load	MW	600	599.53	
4	TMCR	%	100	99.92	
5	Frequency	Hz	50	50	
6	Total Air Flow	T/Hr	757	410.17	410.17
7	Air Flow	M3/sec	200	97.70	97.70
8	Suction Pressure	mm of wc	0.00	0	0
9	Suction Temp	^{O}C	50	29	29
10	Density of Air	kg/M3	1.051	1.1661	1.1661
11	Discharge Pressure	mm of wc	1260	783.21	774.55
12	Total Head	mm of wc	1260	783.21	774.55
13	PA Fan Motor Rating	kW	3200	3200	3200
14	PA Fan Current	Amps	-----	70.96	69.09
15	Power Factor	Factor	-----	0.82	0.81
16	Motor Power Measured	kW	3137	1123.70	1074.93
17	Motor shaft power	kW	3024.35	1083.25	1036.23
18	Fan Air Power	kW	2470.59	750.23	741.93
19	Efficiency of the Fan	%	81.69	69.26	71.60
20	Combined Efficiency	%	78.75	66.76	69.02
21	Motor Loading	%	0.98	35.12	33.59
22	Specific Energy consumption	kW/T	4.15	2.74	2.62

Remarks:

- ✓ The fan efficiency is less when compared with the design for operating parameters of the Fan.
- ✓ The lower fan efficiency is mainly due to flow and head deviation from the Fan BEP.

MEA study on Primary Air Fans of Boiler-2(600 MW)

The performance assessment of PA Fan has been conducted and the operating parameters are recorded in the following table.

Sl. No.	Parameters	Unit	Design	MEA Test	
				PA Fan A	PA Fan B
1	Date			24.01.2024	
2	Duration	Min		2 Hours	
3	Avg. Unit load	MW	600	599.53	
4	TMCR	%	100	99.92	
5	Frequency	Hz	50	50	
6	Total Air Flow	T/Hr	757	448.165	448.165
7	Air Flow	M3/sec	200	106.76	106.76
8	Suction Pressure	mm of wc	0.00	0	0
9	Suction Temp	^{O}C	50	29	29
10	Density of Air	kg/M3	1.051	1.1661	1.1661
11	Discharge Pressure	mm of wc	1260	760.97	785.27
12	Total Head	mm of wc	1260	760.97	785.27
13	PA Fan Motor Rating	kW	3200	3200	3200
14	PA Fan Current	Amps	-----	75.1	75.08
15	Power Factor	Factor	-----	0.83	0.81
16	Motor Power Measured	kW	3137	1203.76	1168.12
17	Motor shaft power	kW	3024.35	1160.43	1126.07
18	Fan Air Power	kW	2470.59	796.45	821.88
19	Efficiency of the Fan	%	81.69	68.63	72.99
20	Combined Efficiency	%	78.75	66.16	70.36
21	Motor Loading	%	0.98	37.62	36.50
22	Specific Energy consumption	kW/T	4.15	2.69	2.61

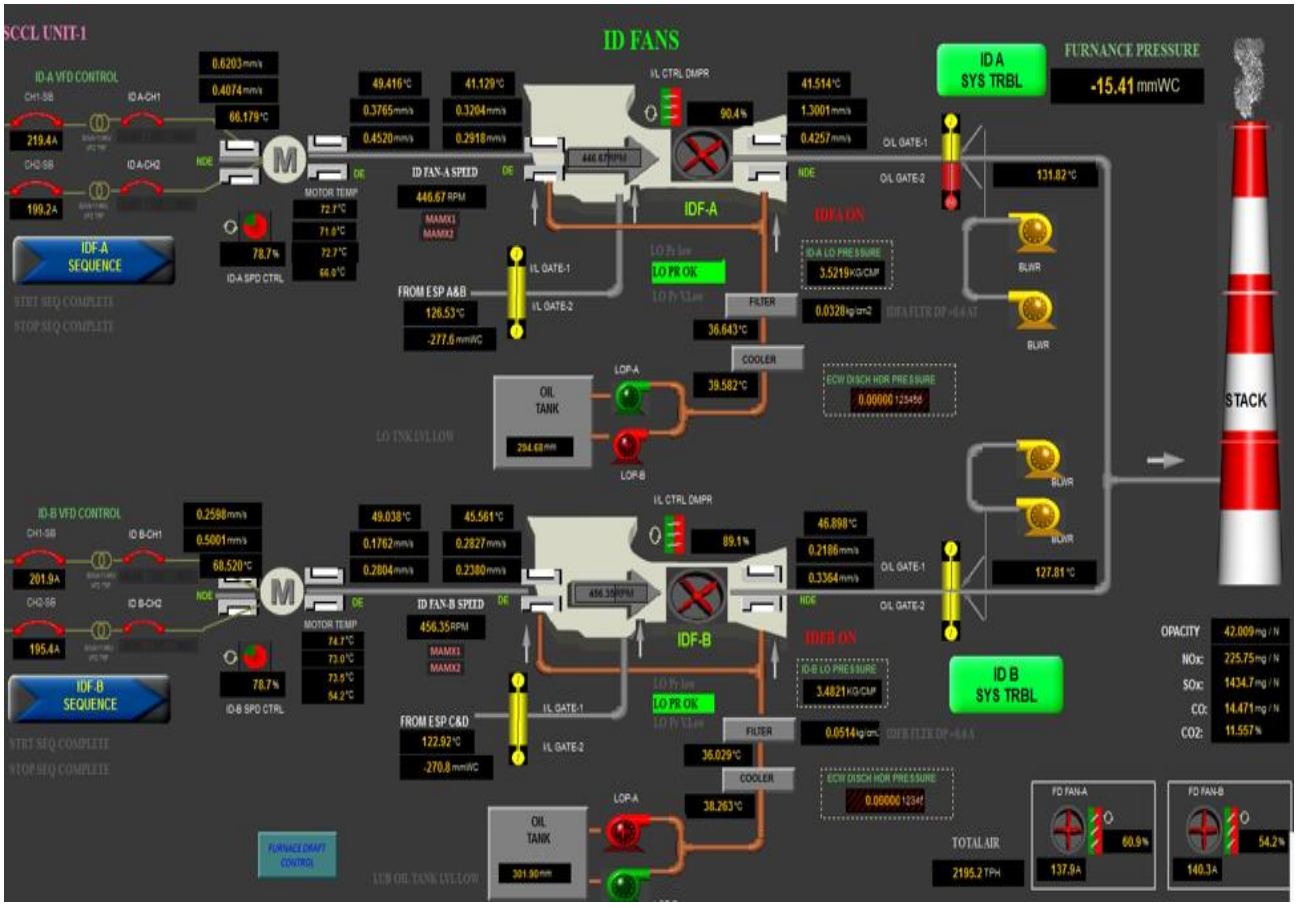
Remarks:

- ✓ The fan efficiency is less when compared with the design for operating parameters of the Fan.
- ✓ The lower fan efficiency is mainly due to flow and head deviation from the Fan BEP.

5.1.6.3 Induced draft Fans.

Induced draft fans are used in power stations mainly for removal of combustibles and for combustion control. In STPP Boiler two numbers of ID fans are employed with the following specification

Make	M/s. BHEL
Type	Radial NDZV 47
Numbers	Two
Flow	570 M^3 /sec
Pressure	480 mm wc
Drive	Motor
Power	3750 kW
Control	Inlet Damper + VFD.



MEA study on Induced Draft Fans of Boiler-1 (600 MW)

The performance assessment of ID Fan has been conducted and the operating parameters are recorded in the following table.

Sl. No	Parameters	Unit	MEA Test	
			ID Fan A	ID Fan B
1	Coal consumption	T/Hr	171.985	171.985
2	Ash in Coal	%	34.3	34.3
4	Stoichiometric air	kg/kg of Fuel	5.32	5.32
5	Fly ash Quantity	TPH	47.19	47.19
6	ESP efficiency	%	99.967	99.967
	Flue Gas density	kg/m3	0.8535	0.8535
7	O2 at APH inlet	%	3.85	3.62
8	O2 at APH outlet	%	5.7	5.23
9	O2 at ID Fan inlet	%	5.7	5.23
10	Flue Gas w.r.t. the o2 value @ APH Inlet	kg/kg of Fuel	7.17	7.09
11	Mass of the FG w.r.t. the o2 value @ APH Outlet	kg/kg of Fuel	7.96	7.74
12	Mass of the FG w.r.t. the o2 value @ ID fan inlet	kg/kg of Fuel	7.96	7.74
13	Flue Gas quantity at APH inlet	T/Hr	1233.66	1218.83
14	Flue Gas quantity at APH outlet	T/Hr	1369.23	1331.78
15	Flue Gas quantity at ID Fan inlet	T/Hr	1369.23	1331.78
		m3/sec	445.63	433.44
16	Air ingress across RAPH	T/Hr	135.57	112.95
17	Total air ingress quantity	T/Hr	135.57	112.95

The performance of ID fans Boiler-1 (600 MW)

Sl. No	Parameters	Unit	Design	MEA Test	
				ID Fan A	ID Fan B
1	Date			24.01.2024	
2	Duration	Hrs		2 Hrs	
3	Avg. Unit load	MW	600	599.53	
4	TMCR	%	100	95.61	
5	Frequency	Hz	50	50	
7	Gas Flow	m3/sec	570	445.63	433.44
8	Gas Flow	T/Hr	1766.567	1369.23	1331.78
9	Flue Gas Density	kg/m3	0.8609	0.8535	0.8535
10	Discharge pressure	mm of wc	0	-7.46	-13.11
11	Suction Pressure	mm of wc	480	-272.37	-265.93
12	Total Differential Pressure	mm of wc	480.00	264.91	252.82
13	ID Fan Motor Rating	kW	3750	3750	3750
14	ID Fan Current	Amps	-----	-----	-----
15	Power Factor	Factor	-----	-----	-----
16	Motor Power Measured	kW	3676	2280	2368.00
17	Motor shaft power	kW	3576.47	2217.98	2261.44
18	Fan Air Power	kW	2682.35	1157.36	1074.33
19	Efficiency of the Fan	%	75	52.18	47.51
20	Combined Efficiency	%	73	50.76	45.37
21	Motor Loading	%	98	61	63
22	Specific Energy consumption	kW/T	2.08	1.67	1.78

Remarks:

- ✓ The Fan efficiency is 52.18 % & 47.51. The efficiency is poor for the measured fan air power with VFD.
- ✓ Hence it requires inspection of internals during shut down as the efficiency is less when compared with the fan curves.

MEA study on Induced Draft Fans of Boiler-2 (600 MW)

The performance assessment of ID Fan has been conducted and the operating parameters are recorded in the following table.

Sl. No	Parameters	Unit	MEA Test	
			ID Fan A	ID Fan B
1	Coal consumption	T/Hr	171.985	171.985
2	Ash in Coal	%	33.54	33.54
4	Stoichiometric air	kg/kg of Fuel	5.32	5.32
5	Fly ash Quantity	TPH	46.15	46.15
6	ESP efficiency	%	99.967	99.967
	Flue Gas density	kg/m3	0.8535	0.8535
7	O2 at APH inlet	%	3.15	3.56
8	O2 at APH outlet	%	5.45	6.2
9	O2 at ID Fan inlet	%	5.45	6.2
10	Flue Gas w.r.t. the o2 value @ APH Inlet	kg/kg of Fuel	6.91	7.05
11	Mass of the FG w.r.t. the o2 value @ APH Outlet	kg/kg of Fuel	7.83	8.20
12	Mass of the FG w.r.t. the o2 value @ ID fan inlet	kg/kg of Fuel	7.83	8.20
13	Flue Gas quantity at APH inlet	T/Hr	1187.80	1213.13
14	Flue Gas quantity at APH outlet	T/Hr	1347.14	1409.80
15	Flue Gas quantity at ID Fan inlet	T/Hr	1347.14	1409.80
		m3/sec	438.44	458.83
16	Air ingress across RAPH	T/Hr	159.33	196.67
17	Total air ingress quantity	T/Hr	159.33	196.67

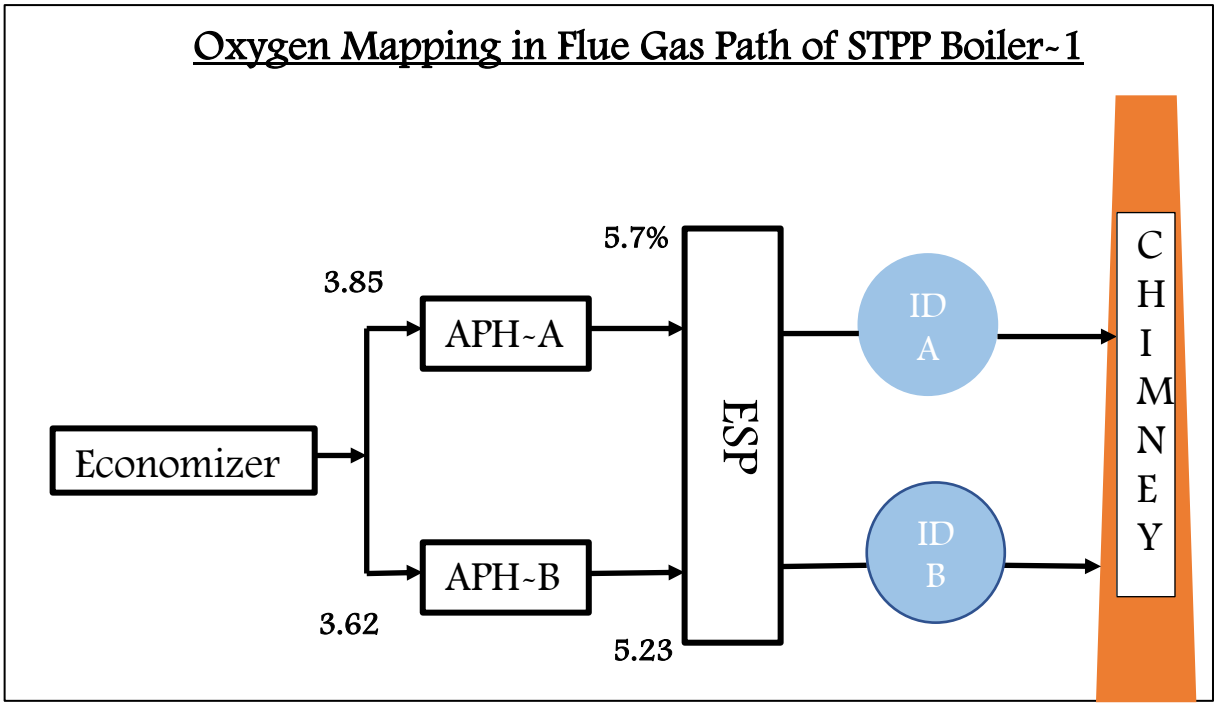
The performance of ID fans Boiler-2 (600 MW)

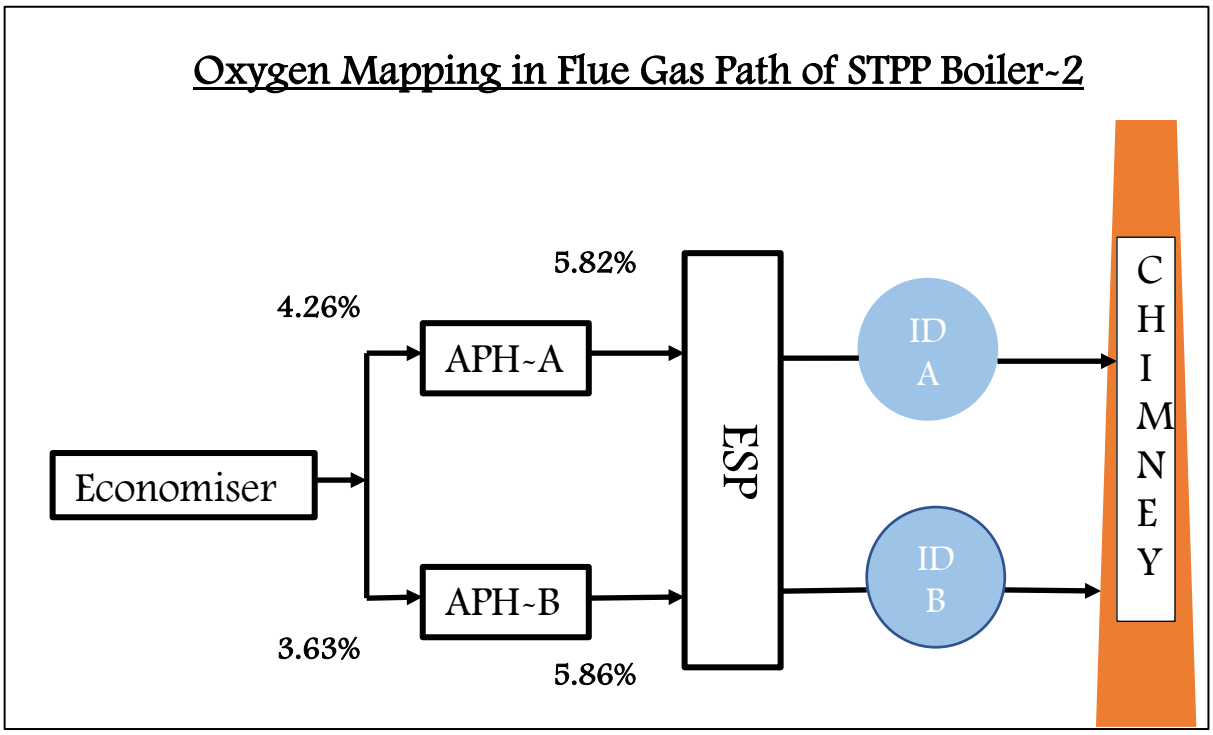
Sl. No	Parameters	Unit	Design	MEA Test	
				ID Fan A	ID Fan B
1	Date			24.01.2024	
2	Duration	Hrs		2 Hrs	
3	Avg. Unit load	MW	800	764.85	
4	TMCR	%	100	95.61	
5	Frequency	Hz	50	50	
7	Gas Flow	m3/sec	570	445.63	433.44
8	Gas Flow	T/Hr	1766.567	1369.23	1331.78
9	Flue Gas Density	kg/m3	0.8609	0.8535	0.8535
10	Discharge pressure	mm of wc	0	-7.46	-13.11
11	Suction Pressure	mm of wc	480	-272.37	-265.93
12	Total Differential Pressure	mm of wc	480.00	264.91	252.82
13	ID Fan Motor Rating	kW	3750	3750	3750
14	ID Fan Current	Amps	-----	-----	-----
15	Power Factor	Factor	-----	-----	-----
16	Motor Power Measured	kW	3676	2785	2752.00
17	Motor shaft power	kW	3576.47	2709.25	2628.16
18	Fan Air Power	kW	2682.35	1157.36	1074.33
19	Efficiency of the Fan	%	75	42.72	40.88
20	Combined Efficiency	%	73	41.56	39.04
21	Motor Loading	%	98	74	73
22	Specific Energy consumption	kW/T	2.08	2.03	2.07

Remarks:

- ✓ The Fan efficiency is 42.72 % & 40.88 %. The efficiency is poor for the measured fan air power with VFD.
- ✓ Hence it requires inspection of internals during shut down as the efficiency is less when compared with the fan curves.

Oxygen Mapping along the draft system with portable flue gas analyser

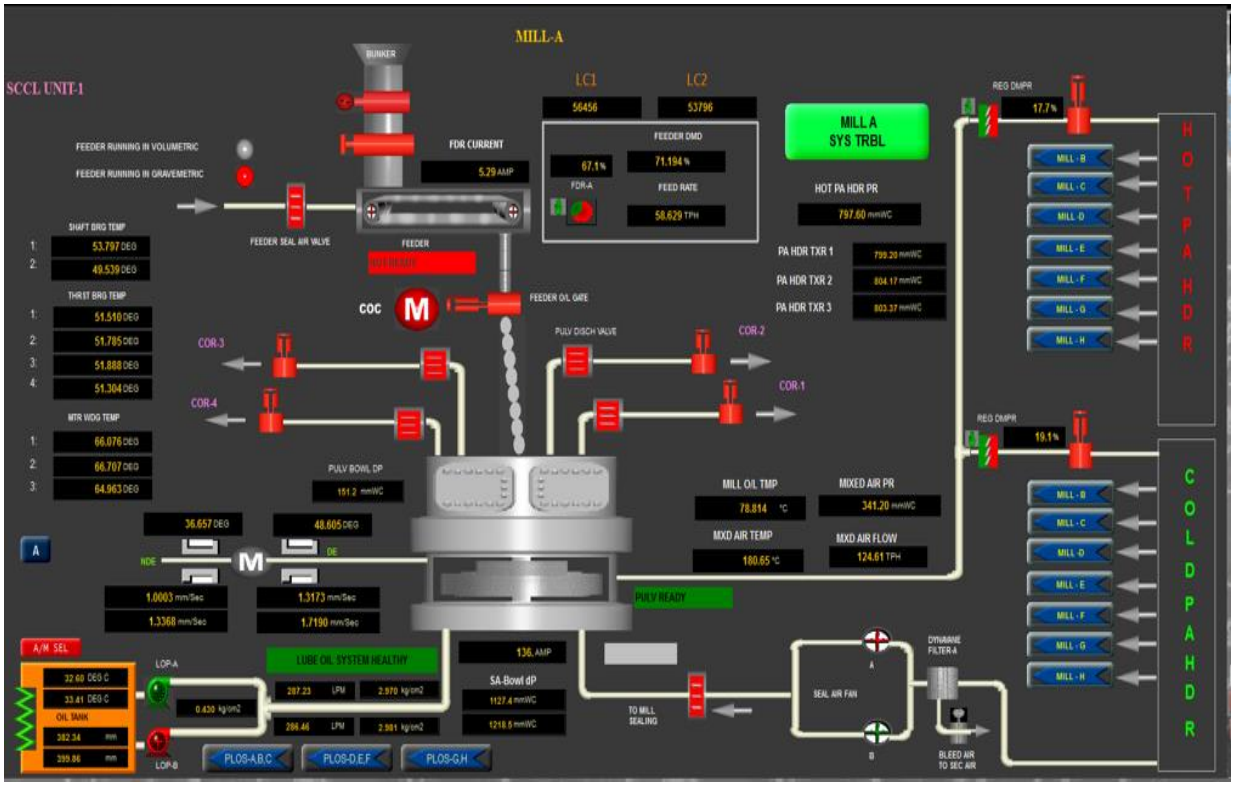




5.1.7 Milling System

Bowl Mills are used in power stations mainly for pulverizing coal. In STP Boiler (600MW) Eight numbers of such Mills are employed with the following specification. 6 Nos will be in operation at full load and two numbers will be on standby.

Manufacturer	: BHEL, Hyderabad
Type	: Bowl Mill
Size	: XRP 1043
No. of Mills	: 8
Speed of Pulverized	: 35
Guaranteed Mill Capacity	: 73.6
Raw coal HGI (Design Coal)	: 52
Raw Coal Total Moisture	: 7.62
Mill Outlet Temperature	: 66-100 ^{o}C.
Pulverized Coal Finess	: 70 % thru 200 mesh 99% thru 50 mesh



To analyses the mill performance the necessary mill parameters were recorded during the boiler trial and shown below.

Coal Mill Performance of Boiler-1 (600 MW)								
Sl. No	Parameter	Unit	1A	1B	1C	1D	1E	1G
1	Unit load	MW	**599.53**					
2	Date of Test		**24.01.2024**					
3	Duration of Test	Min	**2 Hours**					
4	Frequency	Hz	**50**					
5	Coal Flow	TPH	57.25	58.43	56.41	56.78	57.1	58
6	PA flow	TPH	121.47	119.56	117.37	118.66	115.98	121.3
7	PA TEMP TO MILLS	^{o}C	173.16	197.11	184.57	208.07	191.09	218.9
8	AMT	^{o}C	78.87	80.73	76.3	74.32	77.98	78.61
9	Bus Voltage	kV	3.31	3.31	3.31	3.37	3.37	3.31
10	Mill current	A	131.68	144.61	123.84	143.53	127.88	145.84
11	Power Factor	Factor	0.68	0.69	0.73	0.67	0.68	0.70
12	Mill Power	kW	513.34	572.04	518.27	561.30	507.56	585.26
13	Air/Coal ratio	T/T	**2.12**	**2.05**	**2.08**	**2.09**	**2.03**	**2.09**
14	SEC	kW/T	**8.97**	**9.79**	**9.19**	**9.89**	**8.89**	**10.09**

Remarks:

- ✓ All Mills are performing well.
- ✓ The sieve test values are found normal.
- ✓ The Air Coal ratio is higher than the design value of 1.67.
- ✓ However, by maintaining the Before Mill Temp and the air coal ratio considerable energy can be saved.
- ✓ Mill SECs are higher when compared with similar power plants.

To analyse the mill performance the necessary mill parameters were recorded during the boiler trial and shown below.

Coal Mill Performance of Boiler-2 (600 MW)								
Sl. No	Parameter	Unit	2A	2C	2D	2E	2F	2H
1	Unit load	MW	**601.83**					
2	Date of Test		**24.01.2024**					
3	Duration of Test	Min	**2 Hours**					
4	Frequency	Hz	**50**					
5	Coal Flow	TPH	61.58	58.33	61.43	61.49	61.19	55.79
6	PA flow	TPH	123.51	122.71	116.16	119.44	117.99	126.52
7	PA TEMP TO MILLS	^{o}C	211.3	216.11	219.47	210.32	222.71	222.14
8	AMT	^{o}C	81.15	65.13	78.33	77.74	79.65	73.97
9	Bus Voltage	kV	3.37	3.31	3.31	3.37	3.37	3.31
10	Mill current	A	133.51	126.06	130.05	136.36	141.30	133.23
11	Power Factor	Factor	0.68	0.69	0.73	0.67	0.68	0.70
12	Mill Power	kW	529.91	498.66	544.26	533.26	560.83	534.66
13	Air/Coal ratio	T/T	**2.01**	**2.10**	**1.89**	**1.94**	**1.93**	**2.27**
14	SEC	kW/T	**8.61**	**8.55**	**8.86**	**8.67**	**9.17**	**9.58**

Remarks:

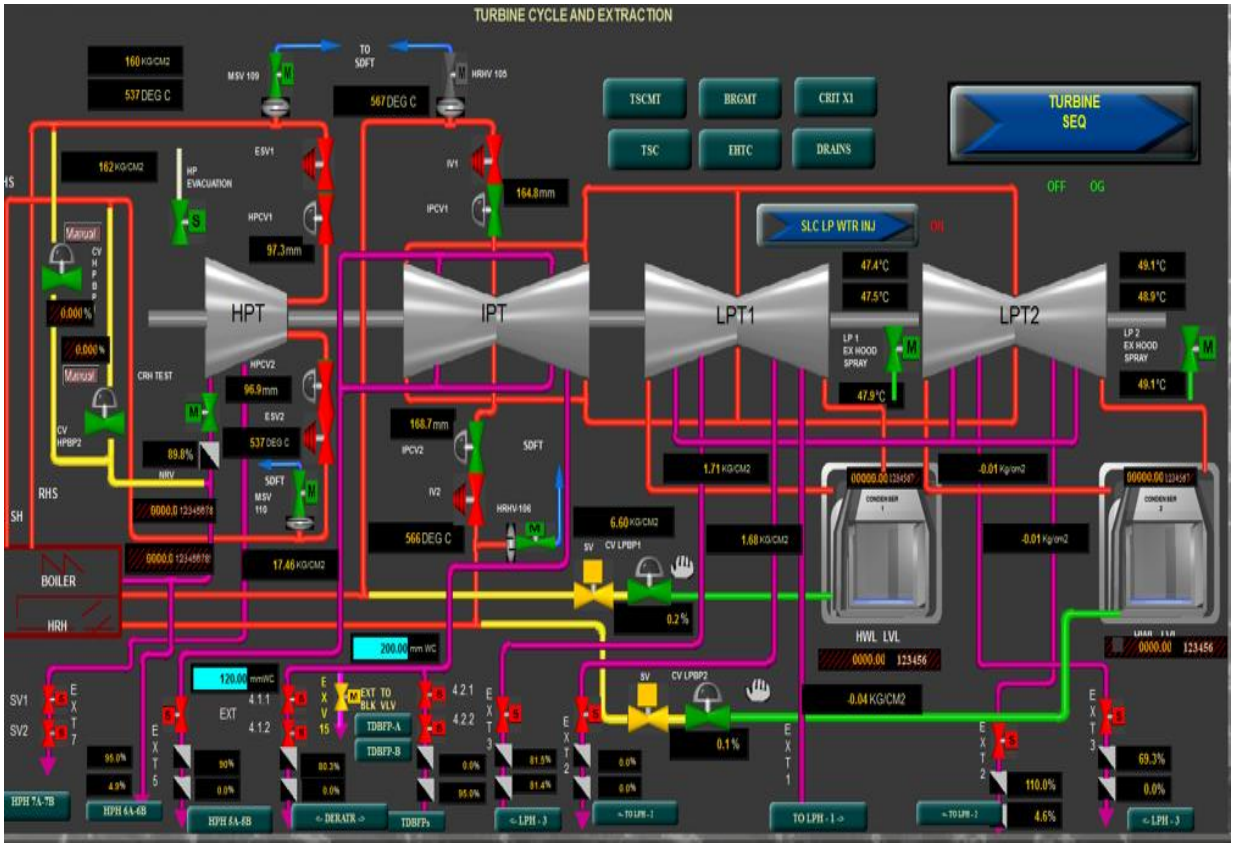
- ✓ All Mills are performing well.
- ✓ The sieve test values are found normal.
- ✓ The Air Coal ratio is higher than the design value of 1.67.
- ✓ However, by maintaining the air coal ratio considerable energy can be saved.
- ✓ Mill SECs are higher when compared with similar power plants.

5.2 Performance of Turbine and its auxiliaries

5.2.1 Steam Turbines

The turbine employed in STPP is BHEL make with separate HP, IP & LP section. HP section is single flow cylinder, IP section is double flow cylinders and LP section is two double flow cylinders. Turbine rotor and Generator rotors is connected by rigid coupling.

- ✓ The Predicted Value for capacity of 100% TMCR is 600 MW, and the steam quantity is 1835.5 T/Hr with pressure 170 ATA and temp 537^{0}C.
- ✓ HRH quantity is 1553.49 T/Hr, 39.753 Kg/ CM^{2}and temp 565^{0}C.
- ✓ Turbine Heat rate is 1927.1 kCal/kWh.
- ✓ The Turbine Heat Rate is an indicator for the performance of the unit and hence the turbine parameters are collected for calculating the operating Heat rate.



5.2.2 Turbine Performance Study:

Turbine Heat Rate parameters:

The TG cycle heat rate was evaluated from test data at 100% TMCR condition All extraction flows to HP heaters and Deaerator are calculated based on mass and energy balance.

Turbine Heat Rate parameters					
Sn	**Description**	**Unit**	**Design**	**Unit-1**	**Unit-2**
1	Unit Load	MW	600	599.53	601.83
2	Main Steam Flow	T/hr	1835.5	1897.65	1843.51
3	main Steam Temp	^{0}C	537	542.9	543.045
4	Main Steam Pressure	Kg/Cm^2	170	167.68	168.865
5	Main Steam Enthalpy	KCal/kg	810.70	815.62	815.406
6	Feed Water Temp ECO Inlet	^{0}C	278	278.73	268
7	Feed water Pressure	Kg/Cm^2	202.02	197.18	196.71
8	Feed water enthalpy	KCal/kg	291.8	292.774	280.187
9	CRH steam Pressure	Kg/Cm^2	43.03	41.50	43.01
10	CRH steam Temp	^{0}C	332.7	342.19	336.375
11	CRH - Steam enthalpy (Actual)	KCal/kg	727.40	733.27	728.772
12	HRH Steam Pressure	Kg/Cm2	38.72	40.64	41.355
13	HRH steam Temp	^{0}C	565	567.89	569.84
14	HRH steam Enthalpy	KCal/kg	858.60	860.11	861.028
15	Extraction 6, 7 steam flow	TPH	276.156	283.66	252.43
16	Gland steam Qty	TPH	5.853	6.00	6
17	HRH steam Flow	T/hr	1553.491	1607.99	1585.08
18	IP Turbine Out let Temp	^{0}C	328.2	330.44	332.93
19	IP Turbine Out let pressure	Kg/Cm2	7.7	7.56	7.49
20	IP Turbine Out let Steam enthalpy (Actual)	KCal/kg	744.60	745.36	746.65

Turbine Heat Rate					
Sn	**Description**	**Unit**	**Design**	**Unit-1**	**Unit-2**
1	Unit Load	MW	600	599.53	601.83
2	Main Steam Flow	T/hr	1835.5	1840.93	1831.98
3	main Steam Temp	^{0}C	537	541.52	539.2
4	Main Steam Pressure	Kg/Cm^2	170	162.96	162.97
5	main Steam Enthalpy	KCal/kg	810.70	814.20	812.65
6	Feed Water Temp ECO Inlet	^{0}C	278	279.43	268.71
7	Feed water Enthalpy	KCal/kg	291.8	292.88	280.29
8	CRH steam Pressure	Kg/Cm^2	43.03	43.11	43.42
9	CRH steam Temp	^{0}C	332.7	341.27	336.4
10	CRH - Steam enthalpy	KCal/kg	727.4	730.22	727.01
11	HRH Steam Pressure	Kg/Cm2	38.72	39.83	40.29
12	HRH steam Temp	^{0}C	565	566.36	564.47
13	HRH steam Enthalpy	KCal/kg	858.6	857.62	856.49
14	HRH steam Flow	T/hr	1553.491	1593	1569.58
15	Reheater spray Qty	T/hr	0	0	0
16	Reheater spray enthalpy	KCal/kg	0	0	0
17	Heat Input to Turbine	Kcal	1156259	1162662	1178502
18	Turbine Heat Rate	KCal/kWh	1927.10	1938.45	1958.20
19	Boiler efficiency	%	88.53	87.32	87.89
20	Unit Gross Heat Rate	kCal/kWh	2176.77	2219.93	2228.01

Observation and analysis:

- ✓ The Turbine Heat rate is higher than the Predicted value of 1927.1 KCal/kWhr.
- ✓ Unit-1 and Unit-2 Heat rate are 1938.45 & 1958.20 respectively.
- ✓ Higher heat rate is mainly due to aging and the steam quality.
- ✓ Condenser vacuum and MS pressure are some of the reasons for higher heat rate.
- ✓ Cylinder efficiencies are also the reason for higher steam consumption and higher Heat rate. It is discussed in the next chapter Cylinder efficiency.

5.2.3 Cylinder Performance Study:

HP Cylinder Efficiency					
Sn	**Description**	**Unit**	**Design**	**Unit-1**	**Unit-2**
1	Unit Load	MW	600	599.53	601.83
2	Main Steam Flow	TPH	1835.5	1898.31	1831.98
3	Main Steam Temp	^{0}C	537	541.52	539.2
4	Main Steam Pressure	Kg/Cm^2	170	162.96	162.97
5	main Steam Enthalpy	KCal/kg	810.70	814.20	812.65
6	CRH steam Pressure	Kg/Cm^2	43.03	43.11	43.42
7	CRH steam Temp	^{0}C	332.7	341.27	336.4
8	CRH - Steam enthalpy (Actual)	KCal/kg	727.40	730.22	727.01
9	CRH - Steam enthalpy(isentropic)	KCal/kg	718.36	721.92	721.00
10	HP Cylinder Efficiency	%	90.21	91.01	93.44

IP Cylinder Efficiency					
Sn	**Description**	**Unit**	**Design**	**Unit-1**	**Unit-2**
1	Unit Load	MW	600	599.53	601.83
2	HRH Steam Pressure	Kg/Cm2	38.72	39.83	40.29
3	HRH steam Temp	^{0}C	565	566.36	564.47
4	HRH steam Enthalpy	KCal/kg	858.60	857.62	856.49
5	HRH steam Flow	T/hr	1553.491	1593.00	1569.58
6	IP Turbine Out let Temp	^{0}C	328.2	332.14	332.58
7	IP Turbine Out let pressure	Kg/Cm2	7.7	7.56	7.48
8	IP Turbine Out let Steam enthalpy (Actual)	KCal/kg	744.60	744.65	744.91
9	IP Turbine Out let Steam enthalpy (Isentropic)	KCal/kg	742.70	739.11	738.05
10	IP cylinder Efficiency	%	92.95	95.33	94.21

Observation and analysis:

- ✓ The steam parameters are to be maintained to avoid increase of Heat rate.

5.2.4 Condenser Performance study

The condenser performance has been carried out and details are as follows.

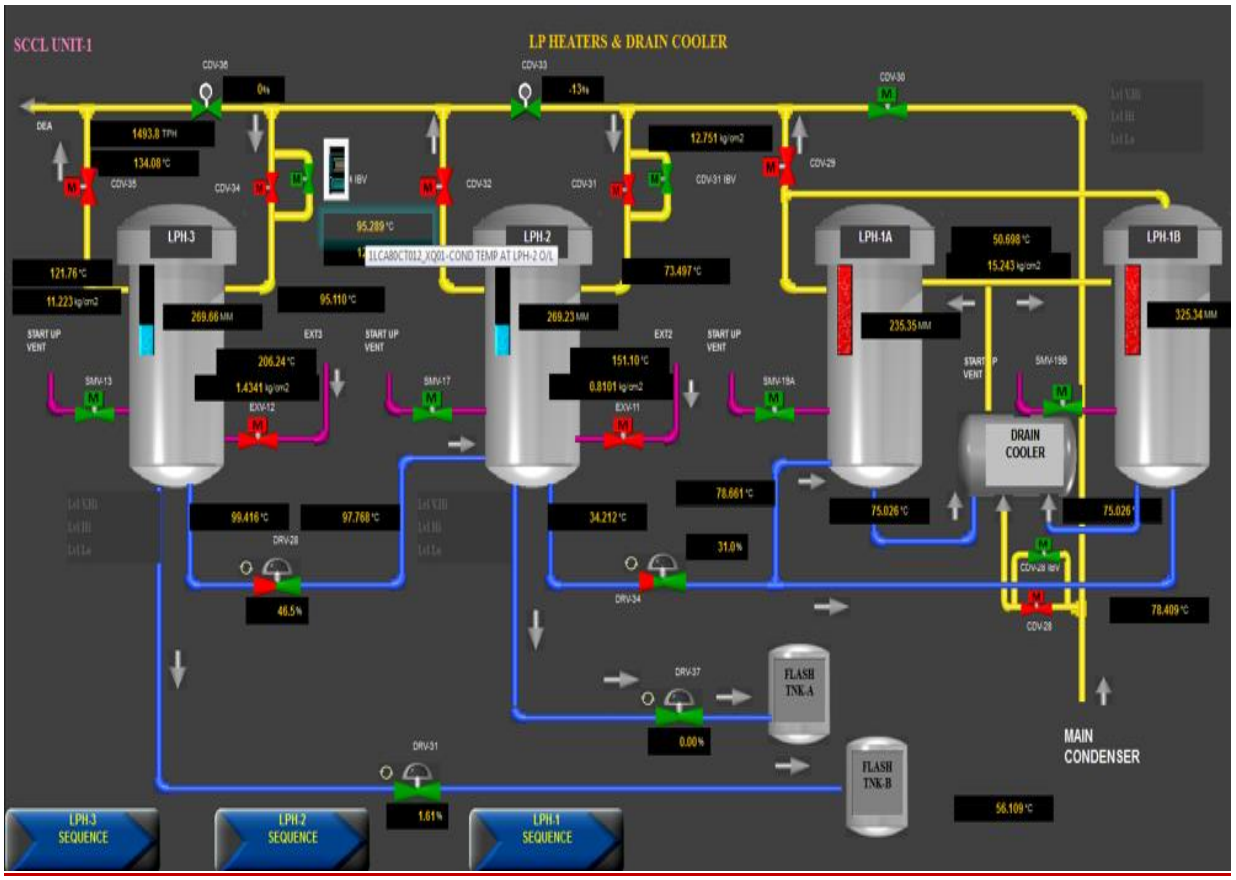
Condenser Performance parameters								
Sn	**Description**	**Unit**	**Design**		**Unit-1**		**Unit-2**	
1	Unit Load	MW	600		599.53		601.83	
2	condenser vacuum (negative pressure)	Kg/Cm^2	0.9285	0.9285	0.9302	0.9322	0.9312	0.9332
4	Saturation Temp (Ts)	^0C	46.325	46.325	46.004	45.6204	45.813	45.4262
5	CW inlet Temp Left (Tci)	^0C	33	33	31.91	31.8	31.88	31.93
6	CW inlet Temp Right (Tci)	^0C	33	33	31.76	31.85	31.79	31.88
7	CW outlet Temp Left (Tco)	^0C	43.3	43.3	43.08	40.45	41.74	41.41
8	CW outlet Temp Right (Tco)	^0C	43.3	43.3	42.35	40.59	42.37	41.7
11	Range (L)-dtw	^0C	10.3	10.3	11.17	8.65	9.86	9.48
12	Range (R)-dtw	^0C	10.3	10.3	10.59	8.74	10.58	9.82
13	**Effectiveness Left**	**%**	**77.30**	**77.30**	**79.25**	**62.59**	**70.77**	**70.24**
14	**Effectiveness Right**	**%**	**77.30**	**77.30**	**74.35**	**63.47**	**75.45**	**72.49**
15	(Ts-Tci) Left	^0C	13.33	13.33	14.09	13.82	13.93	13.50
16	(Ts-Tco) Left	^0C	3.03	3.03	2.92	5.17	4.07	4.02
17	(Ts-Tci) Right	^0C	13.33	13.33	14.24	13.77	14.02	13.55
18	(Ts-Tco) Right	^0C	3.03	3.03	3.65	5.03	3.44	3.73
19	**LMTD (L)**	^0C	**6.95**	**6.95**	**7.10**	**8.80**	**8.02**	**7.82**
20	**LMTD (R)**	^0C	**6.95**	**6.95**	**7.78**	**8.68**	**7.53**	**7.61**

Observation and analysis:

- ✓ Performance of condenser is satisfactory except Unit-1 Condenser “B”.
- ✓ Also, it is observed that in Unit-1 all the three vacuum pumps are running, which indicates air ingress into the condenser. Before shutting down it is suggested to conduct vacuum drop test.
- ✓ For condenser 1B, it suggested to carry out acid cleaning to improve heat transfer.
- ✓ Considering condenser performance during winter and monsoon season cooling tower (1A & 1B) 3 fans may be kept as reserve. Similarly in Unit-2 also.

5.2.5 Regenerative Feed Water Heating

5.2.5.1 LP HEATERS PERFORMANCE OF STPP



LP Heaters Performance of 600 MW Unit-1						
Sl. no	Description	Unit	LPH2		LPH3	
			Design	Actual	Design	Actual
1	Extraction Steam Pressure	kg/cm2	0.94	0.81	2.47	1.43
2	Extraction Steam temp	^{0}C	116.30	150.15	208.90	206.24
3	Main Condensate flow	TPH	1385.78	1511.80	1385.78	1511.80
4	Main condensate Inlet Temp	^{0}C	71.60	73.68	94.70	95.46
5	Main condensate Outlet Temp	^{0}C	94.70	95.46	123.60	122.02
6	Main condensate Inlet enthalpy	Kcal/kg	71.70	73.78	94.90	95.66
7	Main condensate outlet enthalpy	Kcal/kg	94.90	95.66	124.00	122.42
8	Drain Temp	^{0}C	76.40	94.27	99.50	99.52
9	Saturation temp of Extraction	^{0}C	97.46	93.29	126.35	126.29
10	Drain Cooler Approach	^{0}C	4.80	20.59	4.80	4.06
11	Terminal Temp Diff	^{0}C	2.76	-2.17	2.75	4.27
12	Effectiveness	%	89.80	96.00	95.80	96.00
13	Heat Pickup across Heater	MCal/hr	32.15	33.08	40.33	40.46

LP Heaters Performance of 600 MW Unit-2						
Sl. no	Parameters	Units	LPH2		LPH3	
			Design	Actual	Design	Actual
1	Extraction Steam Pressure	kg/cm2	0.94	0.99	2.47	1.54
2	Extraction Steam temp	^{0}C	116.30	141.14	208.90	231.17
3	Main Condensate flow	TPH	1385.78	1523.72	1385.78	1523.72
4	Main condensate Inlet Temp	^{0}C	71.60	73.73	94.70	95.34
5	Main condensate Outlet Temp	^{0}C	94.70	95.34	123.60	124.19
6	Main condensate Inlet enthalpy	Kcal/kg	71.70	73.83	94.90	95.54
7	Main condensate outlet enthalpy	Kcal/kg	94.90	95.54	124.00	124.60
8	Drain Temp	^{0}C	76.40	94.71	99.50	102.08
9	Saturation temp of Extraction	^{0}C	97.46	98.87	126.35	127.72
10	Drain Cooler Approach	^{0}C	4.80	20.98	4.80	6.74
11	Terminal Temp Diff	^{0}C	2.76	3.53	2.75	3.53
12	Effectiveness	%	89.80	92.00	95.80	95.04
13	Heat Pickup across Heater	MCal/hr	32.15	33.08	40.33	44.28

Observation and analysis:

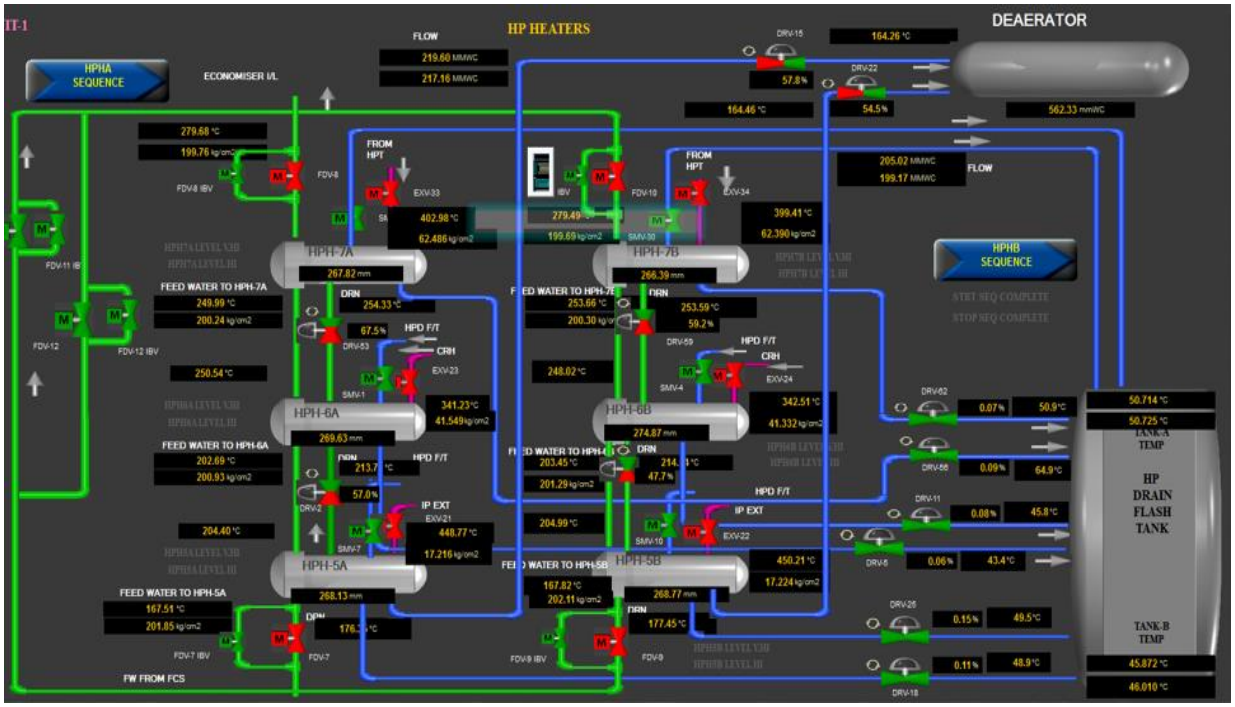
- ✓ The performance of LPHs is satisfactory.
- ✓ An increasing DCA indicates the level is decreasing which may cause tube puncture. Hence it is suggested to maintain the level.
- ✓ An increase in TTD indicates reduced heat transfer.

Performance of De-aerator					
Sl. No	De-aerator	Units	Design	Unit-1	Unit-2
1	Extraction steam Press	Kg/cm^2	7.08	7.56	7.49
2	Extraction steam Temp	^{o}C	327.50	330.44	332.93
3	De-aerator Press	Kg/cm^2	6.93	6.97	7.08
4	FW (Condensate) Temp at Inlet	^{o}C	123.60	122.02	124.19
5	FW out temp. from De-aerator	^{o}C	163.80	164.11	164.41
6	FW (Condensate) enthalpy at Inlet	kCal/kg	124.00	122.42	124.60
7	FW out let from De-aerator enthalpy	kCal/kg	165.30	165.61	165.91
8	HP6 Drain Temp	^{o}C	172.20	176.41	175.04
9	FW through De-aerator	TPH	1835.50	1746.03	1698.44
10	Heat Pick up across De-aerator	x 10^6 KCal/hr	75.81	75.41	70.16

Observation and analysis:

- ✓ The performance of De-aerator is satisfactory for both units 1&2.

5.2.5.2 HP HEATERS PERFORMANCE STUDY



HP Heaters Performance of UNIT - 1						
Sl. no	Parameters	Units	HPH 5A		HPH 5B	
			Design	Actual	Design	Actual
1	Extraction Steam pressure	kg/cm2	18.39	17.23	18.39	17.23
2	Extraction Steam temp	^{0}C	462.90	448.13	462.90	449.49
3	FW flow	TPH	917.75	873.02	917.75	873.02
4	FW Inlet Temp	^{0}C	167.30	167.59	167.30	167.88
5	FW Outlet Temp	^{0}C	207.50	202.90	207.50	203.66
6	Drain Temp	^{0}C	172.20	176.41	172.20	177.60
7	Saturation temp of Extraction	^{0}C	209.93	206.87	209.93	206.87
8	FW Inlet enthalpy	kcal/kg	171.60	169.29	171.60	169.60
9	FW outlet enthalpy	kcal/kg	213.40	206.76	213.40	207.58
10	Drain Cooler Approach	^{0}C	4.90	8.82	4.90	9.72
11	Terminal Temp Diff	^{0}C	2.43	3.97	2.43	3.21
12	Effectiveness	%	98.34	97.00	98.34	97.00
13	Heat Pickup across Heater	MCal/hr	38.36	32.71	38.36	33.16

Sl. no	Parameters	Units	HPH 6A		HPH 6B	
			Design	Actual	Design	Actual
1	Extraction Steam pressure	kg/cm2	40.88	41.61	40.88	41.38
2	Extraction Steam temp	^{0}C	330.60	341.58	330.60	342.79
3	FW flow	TPH	917.75	873.02	917.75	873.02
4	FW Inlet Temp	^{0}C	207.50	202.90	207.50	203.66
5	FW Outlet Temp	^{0}C	250.80	250.28	250.80	254.03
6	Drain Temp	^{0}C	212.30	214.05	212.30	215.07
7	Saturation temp of Extraction	^{0}C	251.98	253.01	251.98	252.68
8	FW Inlet enthalpy	kcal/kg	213.40	206.76	213.40	207.58
9	FW outlet enthalpy	kcal/kg	260.40	259.69	260.40	264.06
10	Drain Cooler Approach	^{0}C	4.80	11.15	4.80	11.41
11	Terminal Temp Diff	^{0}C	1.17	2.73	1.17	-1.35
12	Effectiveness	%	96.10	92.00	96.10	92.00
13	Heat Pickup across Heater	MCal/hr	43.13	46.21	43.13	49.31

Sl. no	Parameters	Units	HPH 7A		HPH 7B	
			Design	Actual	Design	Actual
1	Extraction Steam pressure	kg/cm2	62.59	62.61	62.59	62.51
2	Extraction Steam temp	^{0}C	389.10	403.49	389.10	399.87
3	FW flow	TPH	917.75	873.02	917.75	873.02
4	FW Inlet Temp	^{0}C	250.80	250.28	250.80	254.03
5	FW Outlet Temp	^{0}C	278.00	280.08	278.00	279.86
6	Drain Temp	^{0}C	255.60	254.24	255.60	253.92
7	Saturation temp of Extraction	^{0}C	278.15	278.17	278.15	278.07
8	FW Inlet enthalpy	kcal/kg	260.40	259.69	260.40	264.06
9	FW outlet enthalpy	kcal/kg	291.80	295.53	291.80	295.26
10	Drain Cooler Approach	^{0}C	4.80	3.96	4.80	-0.11
11	Terminal Temp Diff	^{0}C	0.15	-1.91	0.15	-1.79
12	Effectiveness	%	96.53	97.00	96.53	100.00
13	Heat Pickup across Heater	MCal/hr	28.82	31.29	28.82	27.23

HP Heaters Performance of UNIT - 2						
Sl. no			HPH 5A		HPH 5B	
	Parameters	Units	Design	Actual	Design	Actual
1	Extraction Steam pressure	kg/cm2	18.39	17.90	18.39	17.93
2	Extraction Steam temp	^{0}C	462.90	449.90	462.90	448.05
3	FW flow	TPH	917.75	849.22	917.75	849.22
4	FW Inlet Temp	^{0}C	167.30	168.04	167.30	167.96
5	FW Outlet Temp	^{0}C	207.50	203.29	207.50	193.73
6	Drain Temp	^{0}C	172.20	175.04	172.20	173.72
7	Saturation temp of Extraction	^{0}C	209.93	208.66	209.93	208.74
8	FW Inlet enthalpy	kcal/kg	171.60	169.76	171.60	169.68
9	FW outlet enthalpy	kcal/kg	213.40	207.18	213.40	196.90
10	Drain Cooler Approach	^{0}C	4.90	7.00	4.90	5.76
11	Terminal Temp Diff	^{0}C	2.43	5.37	2.43	15.01
12	Effectiveness	%	98.3	98	98.3	98
13	Heat Pickup across Heater	MCal/hr	38.36	31.77	38.36	23.12

Sl. no			HPH 6A		HPH 6B	
	Parameters	Units	Design	Actual	Design	Actual
1	Extraction Steam pressure	kg/cm2	40.88	42.47	40.88	42.19
2	Extraction Steam temp	^{0}C	330.60	338.80	330.60	336.31
3	FW flow	TPH	917.75	849.22	917.75	849.22
4	FW Inlet Temp	^{0}C	207.50	203.29	207.50	193.73
5	FW Outlet Temp	^{0}C	250.80	239.46	250.80	234.06
6	Drain Temp	^{0}C	212.30	213.54	212.30	204.98
7	Saturation temp of Extraction	^{0}C	251.98	254.21	251.98	253.82
8	FW Inlet enthalpy	kcal/kg	213.40	207.18	213.40	196.90
9	FW outlet enthalpy	kcal/kg	260.40	247.24	260.40	241.12
10	Drain Cooler Approach	^{0}C	4.80	10.25	4.80	11.25
11	Terminal Temp Diff	^{0}C	1.17	14.75	1.17	19.76
12	Effectiveness	%	96.10	98.00	96.10	92.11
13	Heat Pickup across Heater	MCal/hr	43.13	34.02	43.13	37.55

Sl. no	Parameters	Units	HPH 7A		HPH 7B	
			Design	Actual	Design	Actual
1	Extraction Steam pressure	kg/cm2	62.59	61.09	62.59	61.83
2	Extraction Steam temp	^{0}C	389.10	395.55	389.10	388.25
3	FW flow	TPH	917.75	849.22	917.75	849.22
4	FW Inlet Temp	^{0}C	250.80	239.46	250.80	234.06
5	FW Outlet Temp	^{0}C	278.00	275.25	278.00	264.73
6	Drain Temp	^{0}C	255.60	245.49	255.60	237.65
7	Saturation temp of Extraction	^{0}C	278.15	276.58	278.15	277.36
8	FW Inlet enthalpy	kcal/kg	260.40	247.24	260.40	241.12
9	FW outlet enthalpy	kcal/kg	291.80	289.54	291.80	276.74
10	Drain Cooler Approach	^{0}C	4.80	6.03	4.80	3.59
11	Terminal Temp Diff	^{0}C	0.15	1.33	0.15	12.63
12	Effectiveness	%	96.53	96	96.53	98
13	Heat Pickup across Heater	MCal/hr	28.82	35.92	28.82	30.25

Observation and analysis:

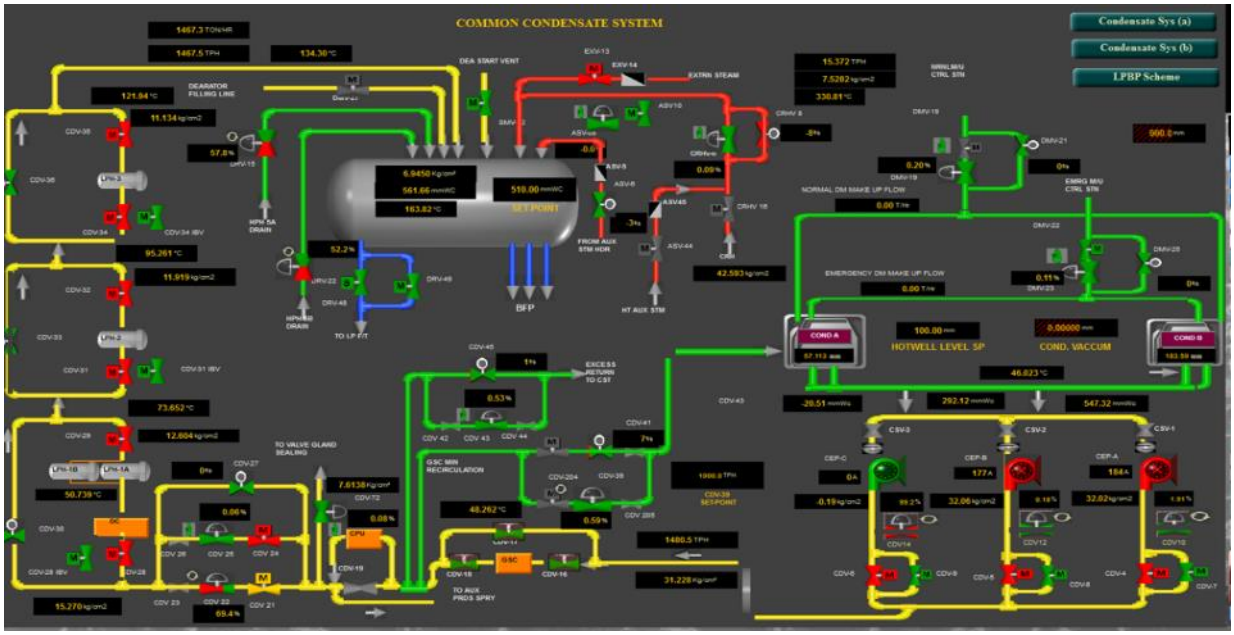
- ✓ Performance of HPHs of both units are satisfactory.
- ✓ An increasing DCA indicates the level is decreasing which may cause tube puncture. Hence it is suggested to maintain the level.
- ✓ An increase in TTD indicates reduced heat transfer.
- ✓ Unit-2 HPH 7B needs inspection for tube puncture.
- ✓ Maintain HPH 6A & 6B level in both units 1& 2.

5.2.6 Turbine Auxiliaries

5.2.6.1 Performance Assessment of Condensate Extraction Pumps

These pumps are used to pump the steam condensate collected in the condenser through GSC, DC & LPH to Deaerator. Three such pumps are employed in this 600 MW Unit. Out of which two will be in service at TMCR and one will be standby.

Pump Manufacturer	: BHEL, Hyderabad
Model	: EN7J40
No. of stages	: 4
Design flow	: 900 m^3/hr.
Specific weight of water	: 988.4 kg/m^3
Total Differential Head	: 290 mlc
Pump Input Power	:873 kW.
Motor rating	: 1230 kW
Pump efficiency	: 80.5%.
Speed	: 1490 rpm
Voltage rating	: 3.3 kV, 3ph, 50 Hz.



Performance study on Condensate Extraction Pump Unit-1 & 2							
S. No	**Item Ref**	**Units**	**Design**	**Unit-1**		**Unit-2**	
				CEP-B	**CEP-C**	**CEP-B**	**CEP-C**
1	Load	MW	600	599.53		601.83	
2	CEP flow	m^3/hr	900	751.42	778.13	751.42	778.13
		T/Hr	890	742.70	769.10	742.70	769.10
3	Suction. Pressure	kg/cm^2	0	-0.9302	-0.9322	-0.9312	-0.9332
4	Disch. Pressure	kg/cm^2	29	31.81	31.78	31.81	31.78
5	Total head	mwc	290	327.402	327.122	327.412	327.132
6	Motor Rated Power	kW	1150	1150	1150	1150	1150
7	CEP Current	Amps	-----	178.52	185.35	178.52	185.35
8	Power Factor	Factor	-----	0.88	0.89	0.89	0.88
9	Motor Input power	kW	913.10	900.63	945.71	910.86	935.09
10	Pump Shaft power	kW	873	860.10	903.15	869.87	893.01
11	Liquid kW	kW	702.97	662.61	685.58	662.64	685.60
12	Pump Efficiency	%	80.52	77.04	75.91	76.18	76.77
13	Combined Efficiency	%	76.99	73.57	72.49	72.75	73.32
14	% Load on motor	%	0.79	0.78	0.82	0.79	0.81
15	**SEC**	**kW/T**	**1.03**	**1.21**	**1.23**	**1.23**	**1.22**

Remarks:

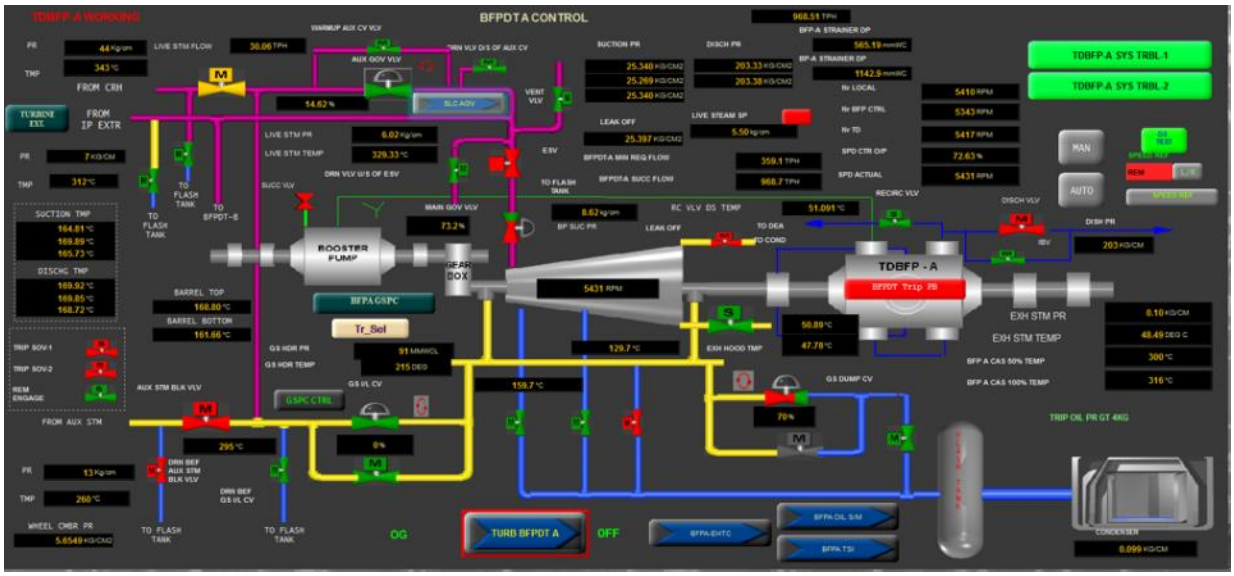
- ✓ The efficiency of the Pumps 1B, 1C, 2B and 2C are 77.4 %, 75.91 %, 76.18% & 76.77 respectively.
- ✓ The SEC of pump 1B, 1C, 2B and 2C is 1.21, 1.23, 1.23, 1.22 kW/T.
- ✓ The lower pump efficiency may be due to the operating parameters are away from the pump BEP.
- ✓ As the working pressure is higher than the required pressure, explore the possibility of de-staging in consultation with the OEM(BHEL). Normally the working pressure will be around 24 to 25 KSC in similar capacity unit. This modification will reduce the power consumption by 150 KW per pump.

5.2.6.2 Performance Assessment of TDBFP

The Major power consuming equipment in a Power Plant Boiler is Boiler Feed Pumps which consumes nearly 3 to 4 % of the Unit Generation. In order to bring down the auxiliary consumption in 600MW it is opted for steam driven Feed pumps. In this Unit one No of Motor Driven Feed Pump and Two Nos of Steam driven Feed pumps are employed.

For Steam Driven Feed pump 4th extraction steam from the outlet of IP turbine is being used and the exhaust steam is connected to the main turbine condenser. The specification of the TDBFP is.

No. of stages	:4
Design flow	: 1220 m^3/hr.
Specific weight of water	: 902 kg/m^3
Total Differential Head (BFP & BP)	: 3370 mlc
Pump efficiency	: 80.2%.
Speed (max)	: 6010 rpm.
Booster Pump	
Design flow	: 1220 m^3/hr.
Specific weight of water	: 902 kg/m^3
Total Differential Head	: 192 mlc
Pump efficiency	: 82.3%.
Speed	: 1495 rpm



The performance of the Steam driven Feed pump was studied with the following parameters.

Turbine Driven BFP Analysis

Sl. No	Item Ref	Units	Design		Unit-1	
	Date		TDBFP A	TDBFP B	TDBFP A	TDBFP B
1	Plant Load	MW	600		599.53	
2	BFP flow	TPH	917.75	917.75	873.00	873.00
3	Suction. Pressure	kg/cm^2	9.08	9.08	8.56	8.56
4	Disch. Pressure	kg/cm^2	205.02	205.02	205.54	205.46
5	Total head	Meters	1959.40	1959.40	1969.80	1969.00
6	Steam flow to TD BFP	Tons	39.37	39.37	30.58	39.15
7	Steam Inlet Pressure	kg/cm^2	6.78	6.78	6.66	6.66
8	Steam outlet pressure	kg/cm^2	0.1060	0.1060	0.1020	0.1740
9	Steam inlet Temp	Deg C	327.20	327.20	329.44	329.44
10	Steam inlet Enthalpy	kCal/kg	744.60	744.60	745.32	745.32
11	Steam outlet Enthalpy	kCal/kg	596.90	596.90	594.41	599.23
12	energy Out Put of the turbine	kW	6760.71	6760.71	5366.11	6650.54
13	Hydraulic power	kW	4900.20	4900.20	4686.01	4684.10
14	Over all TDFP efficiency (including Booster pump)	%	72.48	72.48	87.33	70.43
15	**SEC**	**T/T**	**0.043**	**0.043**	**0.035**	**0.045**

Sl. No	Item Ref	Units	Design		Unit-2	
	Date		TDBFP A	TDBFP B	TDBFP A	TDBFP B
1	Plant Load	MW	600		601.83	
2	BFP flow	TPH	917.75	917.75	849.22	849.22
3	Suction. Pressure	kg/cm^2	9.08	9.08	8.08	8.08
4	Disch. Pressure	kg/cm^2	205.02	205.02	203.68	203.67
5	Total head	Meters	1959.40	1959.40	1956.00	1955.90
6	Steam flow to TD BFP	Tons	39.37	39.37	34.01	28.91
7	Steam Inlet Pressure	kg/cm^2	6.78	6.78	6.59	6.59
8	Steam outlet pressure	kg/cm^2	0.1060	0.1060	0.1730	0.1180
9	Steam inlet Temp	Deg C	327.20	327.20	331.93	331.93
10	Steam inlet Enthalpy	kCal/kg	744.60	744.60	746.60	746.60
11	Steam outlet Enthalpy	kCal/kg	596.90	596.90	599.18	595.70
12	energy Out Put of the turbine	kW	6760.71	6760.71	5830.79	5072.13
13	Hydraulic power	kW	4900.20	4900.20	4526.43	4526.20
14	Over all TDFP efficiency (including Booster pump)	%	72.48	72.48	77.63	89.24
15	SEC	T/T	0.043	0.043	0.040	0.034

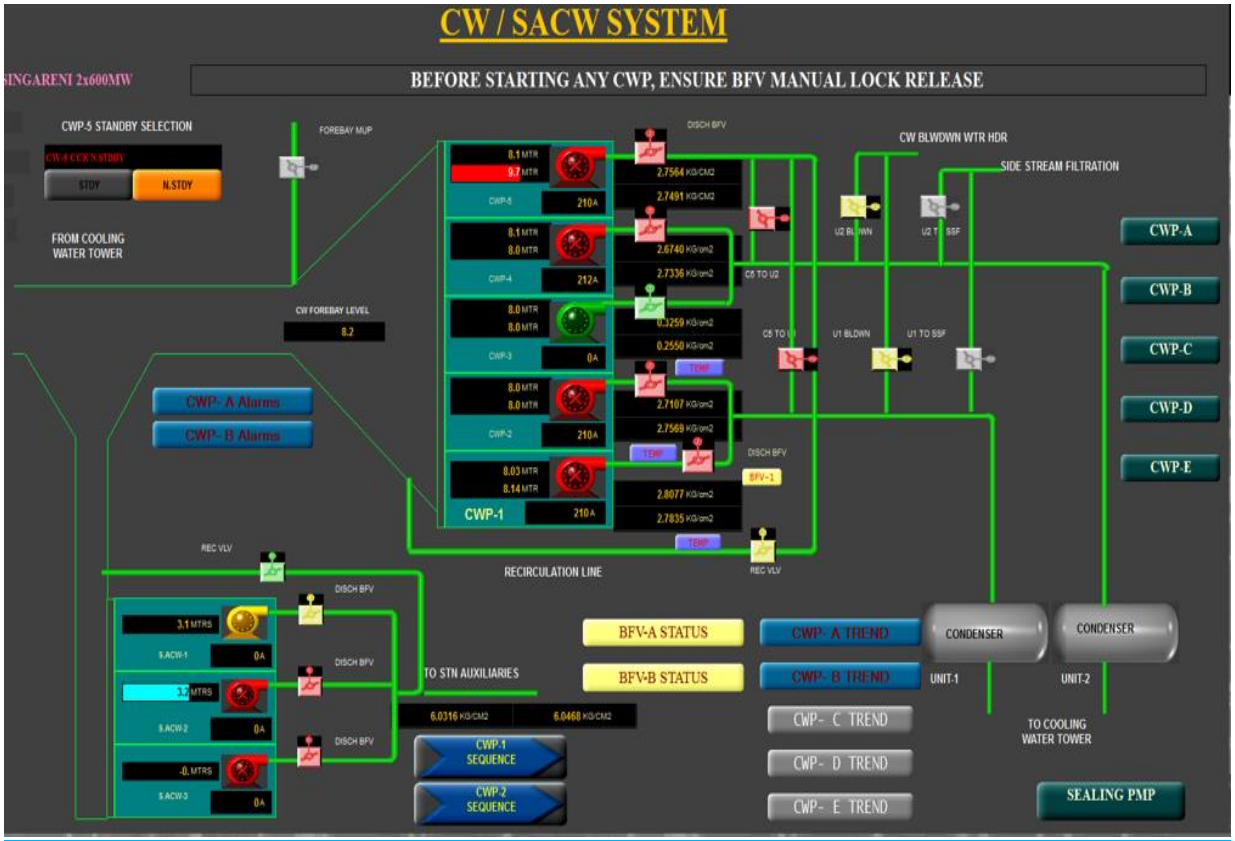
Remarks:

- ✓ TDBFP 1-A & 1-B overall efficiency including Booster pump are 87.33 & 70.43 %.
- ✓ TDBFP 1-A steam consumption is very much less, hence it is suggested to validate the steam flow measuring instrument.
- ✓ TDBFP 1-B overall efficiency is nearer to the design efficiency.
- ✓ TDBFP 2-A & 2-B overall efficiency including Booster pump are 77.63 & 89.24 %.
- ✓ TDBFP 2-A & 2B steam consumption is very much less, hence it is suggested to validate the steam flow measuring instrument.

5.2.6.3 Performance Assessment of Cooling Water Pumps

Cooling water Pumps are employed in Power station to circulate the Re-cooled water to condenser and back to cooling tower. In this Unit 5 Nos of Cooling water pumps are there, out of which 4 Numbers are in service at TMCR and one number as reserve. The CW Pump specifications are as below.

Pump Manufacturer	: Kirloskar Brothers Limited
Model	: CVP2200E
No. of pumps	: 5
Design flow	: 36000 m^3/hr.
Dynamic Head	: 29 mlc
Pump Input Power	:3159.04kW
Pump efficiency	: 90%.



CWP Pumps Analysis 2X600 MW							
Sl. No	Parameter	Units	Design	MEA Test Value			
				CWP-A	CWP-B	CWP -D	CWP -E
1	Unit Load	MW	600	599.53 & 601.83			
2	CWP Flow	m^3/hr	36000	30000	31000	30500	31200
3	Suction head	mwc	0	-4	-4	-4	-4
4	Disch. Pressure	mwc	29	28.1	27.5	27.7	26.9
5	Total head	mwc	29	32.1	31.5	31.7	30.9
6	Motor Rated Power	kW	3600	3600	3600	3600	3600
7	CWP Current	Amps	-----	209.54	210.16	211.87	209.81
8	Power Factor	Factor	-----	0.76	0.76	0.75	0.75
9	Motor Input Power	kW	3308	3034.04	3043.02	3027.41	2997.98
10	Shaft Power	kW	3159	2897.51	2906.08	2891.177	2863.0662
11	Liquid Power	kW	2844.90	2624.18	2660.963	2634.666	2627.118
12	Pump Efficiency	%	90	90.57	91.57	91.13	91.76
13	Combined Efficiency	%	86.00	86.49	87.44	87.03	87.63
14	% Load on motor	%	91.88	84.28	84.53	84.09	83.28
15	**SEC**	**kW/T**	**0.0919**	**0.1011**	**0.0982**	**0.0993**	**0.0961**

Remarks:

- ✓ The performance of CW Pumps are satisfactory.

5.2.6.4 Performance of Cooling Towers

The performance of cooling tower is as follows.

COOLING TOWER PERFORMANCE UNIT-1 & 2							
S.NO	PARAMETER	Unit	Design	1A	1B	2A	2B
1	Load	MW	600	599.53	599.53	601.83	601.83
2	RECOOLED WATER TEMP	Deg C	32	31.835	31.825	31.835	31.905
3	HOT WATER TEMP AT CT I/L (L)	Deg C	42.5	43.08	40.52	42.055	41.555
4	Entry Air WBT	Deg C	27.7	23	23	23	23
5	Entry Air DBT	Deg C	34.39	29	29	29	29
6	CW FLOW IN	m^3/hr	36000	31000	32000	31200	31500
7	Range	Deg C	10.5	11.245	8.695	10.22	9.65
8	Approach	Deg C	4.3	8.835	8.825	8.835	8.905
9	Effectiveness	%	**70.95**	**56.00**	**49.63**	**53.63**	**52.01**

Remarks:

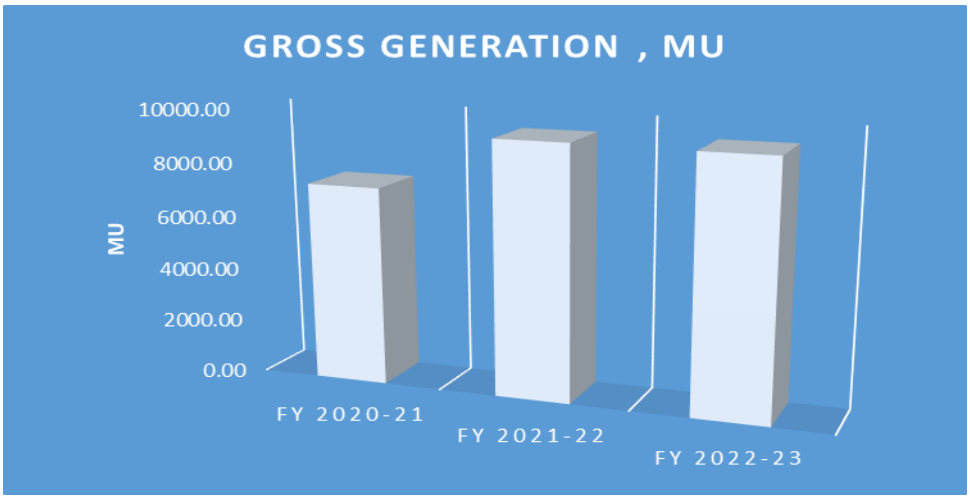
- ✓ The Performance of cooling tower is to be improved.
- ✓ The approach is very high.
- ✓ Inspect and ensure flow nozzle healthiness.
- ✓ Inspect for silt deposit in the fills and ensure cleanliness.
- ✓ Replace damaged fills.
- ✓ Adjust Fan Blade angle to increase air flow.

6 Plant performance.

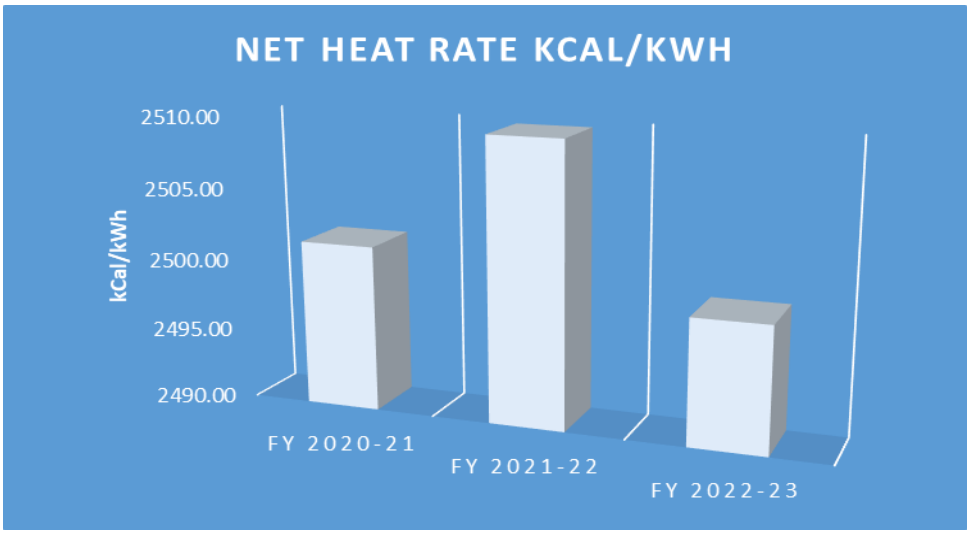
The overall plant performance analysis of SINGARENI THERMAL POWER PLANT (2 X 600 MW) has been carried out for three FY 2020-23 and details are as follows:

PARAMETER	UNITS	FY 2020-21	FY 2021-22	FY 2022-23
GENERATION	MU	7345.06	9352.93	9303.96
PLF	%	69.87	88.97	88.51
Aux power consumption	%	6.10	5.80	6.10
GROSS HEAT RATE	KCal/kWh	2348.00	2363.00	2348.00
NET HEAT RATE	KCal/kWh	2501.54	2509.61	2498.73

The graphical representation of Gross Generation details is as follows.



The graphical representation of Net heat rate is as follows.



7 Auxiliary power consumption

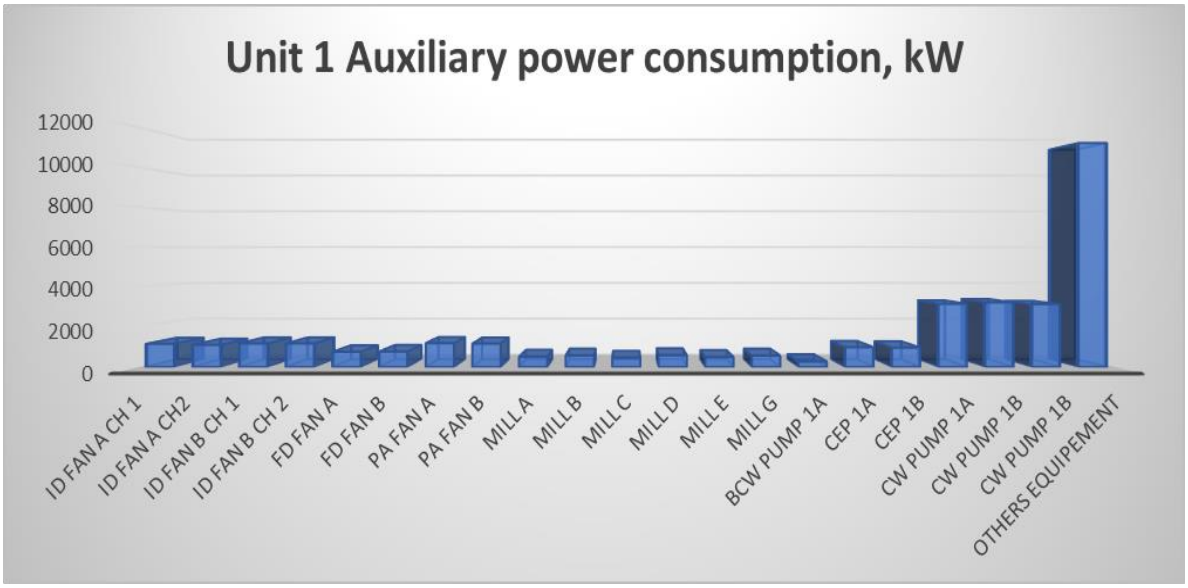
The equipment wise auxiliary power consumption details are as follows.

Unit 1:

Equipment Name	Measured power, kW
ID fan A CH 1	1166
ID fan A CH2	1114
ID fan B CH 1	1185
ID fan B CH 2	1183
FD fan A	764
FD fan B	777
PA fan A	1202
PA fan B	1176
Mill A	520
Mill B	581
Mill C	465
Mill D	595
Mill E	503
Mill G	579
BCW Pump 1A	282
CEP 1A	991
CEP 1B	977
CW pump 1A	3164
CW pump 1B	3236
CW pump 1B	3142
others equipment	11198
Total power	34800
APC %	5.8

The graphical representation details of the APC of units are as follows:

Unit 1:

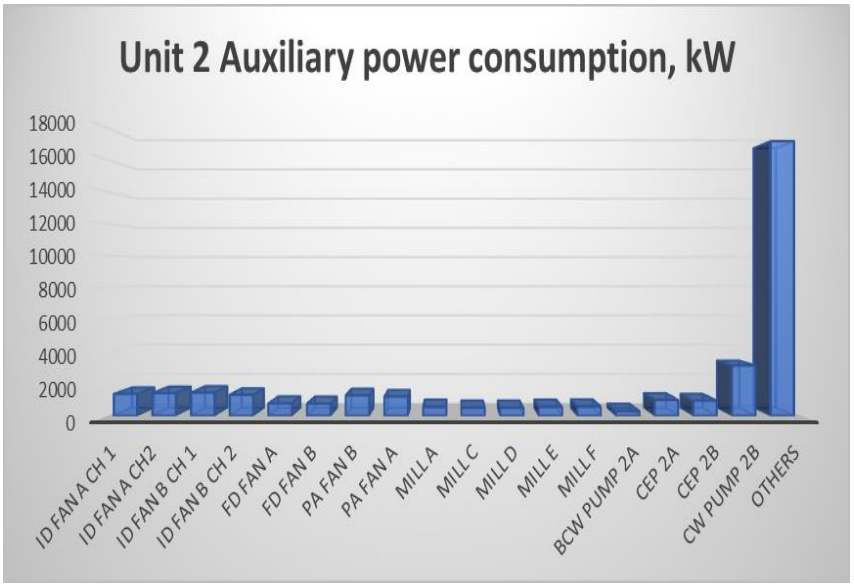


Unit 2:

Equipment Name	Measured power, kW
ID fan A CH 1	1366
ID fan A CH2	1419
ID fan B CH 1	1450
ID fan B CH 2	1312
FD fan A	779
FD fan B	766
PA fan B	1282
PA fan A	1201
Mill A	562
Mill C	500
Mill D	505
Mill E	566
Mill F	580
BCW Pump 2A	296
CEP 2A	993
CEP 2B	946
CW pump 2B	3140
others	17137
Total power	34800
APC %	5.8

Remarks:

The graphical representation details of the APC of unit 2 are as follows:



8 Energy efficiency in utility and process system

8.1 Compressed air system performance

8.1.1 BTG Area

The plant has installed three numbers of instrument air centrifugal compressors and two numbers of service air compressors.

8.1.1.1 Instrument Air compressor:

The FAD test of service air compressor is carried out using time method and details are as follows.

Description	Units	IAC A	IAC B	IAC C
Make	-	Ingersoll Rand	Ingersoll Rand	Ingersoll Rand
Type	-	Centrifugal compressor	Centrifugal compressor	Centrifugal compressor
Model	-	C27MX3	C27MX3	C27MX3
Sea level pressure	kg/cm^2	1.03	1.03	1.03
Altitude	mts	140	140	140
Suction pressure at altitude	kg/cm^{2}G	0.996	0.996	0.996
Set pressure	kg/cm^{2}G	6.9	6.9	6.8
Ambient Room temperature	˚C	30	31	26
Air discharge temperature	˚C	118	110	95
Rated capacity	NM3/min	53	53	53
Rated capacity	CFM	2177	2177	2177
Motor Rating	kW	450	450	450
Temperature correction	factor	0.77	0.79	0.81
Altitude correction factor	factor	0.97	0.97	0.97
Starting Pressure	bar	0.2	0.2	0.0
Ending Pressure	bar	6.9	6.9	6.9
Time Taken	sec	90	104	104
Tank capacity	m3	10.00	10.00	10.00
Additional Pipe size	m3	0.88	0.88	0.88
FAD	CFM	1695	1467	1506
Corrected	m3/hr	2158.5	1913.3	2010.1
Corrected CFM	**CFM**	**1270**	**1126**	**1183**
Measured power	**kW**	**373**	**374**	**380**
Rated SPC	**kW/CFM**	**0.21**	**0.21**	**0.21**
Actual SPC	**kW/CFM**	**0.294**	**0.332**	**0.321**

Remarks:

IAC A:

- ✓ The FAD test for IAC A is calculated to be 1270 CFM which is 42% deviation from rated value 2177 CFM.
- ✓ The actual SEC is calculated to be 0.294 kW/CFM which is 42% deviation from rated value of 0.21 kW/CFM.
- ✓ It is recommended to replace the centrifugal compressors to screw compressor to achieve energy savings.

IAC B:

- ✓ The FAD test for IAC B is calculated to be 1126 CFM which is 48% deviation from rated value 2177 CFM.
- ✓ The actual SEC is calculated to be 0.294 kW/CFM which is 60% deviation from rated value of 0.21 kW/CFM.
- ✓ It is recommended to replace the centrifugal compressors to screw compressor to achieve energy savings.

IAC C:

- ✓ The FAD test for IAC C is calculated to be 1183 CFM which is 46% deviation from rated value 2177 CFM.
- ✓ The actual SEC is calculated to be 0.321 kW/CFM which is 55% deviation from rated value of 0.21 kW/CFM.
- ✓ It is recommended to replace the centrifugal compressors to screw compressor to achieve energy savings.

8.1.1.2 Service Air compressor:

The FAD test of service air compressor is carried out using time method and details are as follows.

Description	Units	SAC A	SAC B
Make	-	Ingersoll Rand	Ingersoll Rand
Type	-	Centrifugal compressor	Centrifugal compressor
Model	-	C27MX3	C27MX3
Sea level pressure	kg/cm^2	1.03	1.03
Altitude	mts	140	140
Suction pressure at altitude	kg/cm^2G	0.996	0.996
Set pressure	kg/cm^2G	6.9	6.9
Ambient Room temperature	˚C	30	30
Air discharge temperature	˚C	120	120
Rated capacity	CFM	2177	2177
Motor Rating	kW	450	450
Temperature correction	factor	0.77	0.77
Altitude correction factor	factor	0.97	0.97
Starting Pressure	bar	0.3	0.3
Ending Pressure	bar	6.9	6.9
Time Taken	sec	55	50
Tank capacity	m3	10.00	10.00
Additional Pipe size	m3	0.09	0.09
FAD	CFM	2544	2798
Corrected	M3/hr	3222.2	3544.4
Corrected CFM	**CFM**	**1896**	**2086**
Measured power	kW	411	439
Rated SPC	**kW/CFM**	**0.21**	**0.21**
Actual SPC	**kW/CFM**	**0.217**	**0.211**

Remarks:

SAC A:

- ✓ The FAD test for SAC A is calculated to be 1896 CFM which is 13% deviation from rated value 2177 CFM.
- ✓ The actual SEC is calculated to be 0.217 kW/CFM which is 5% deviation from rated value of 0.21 kW/CFM.

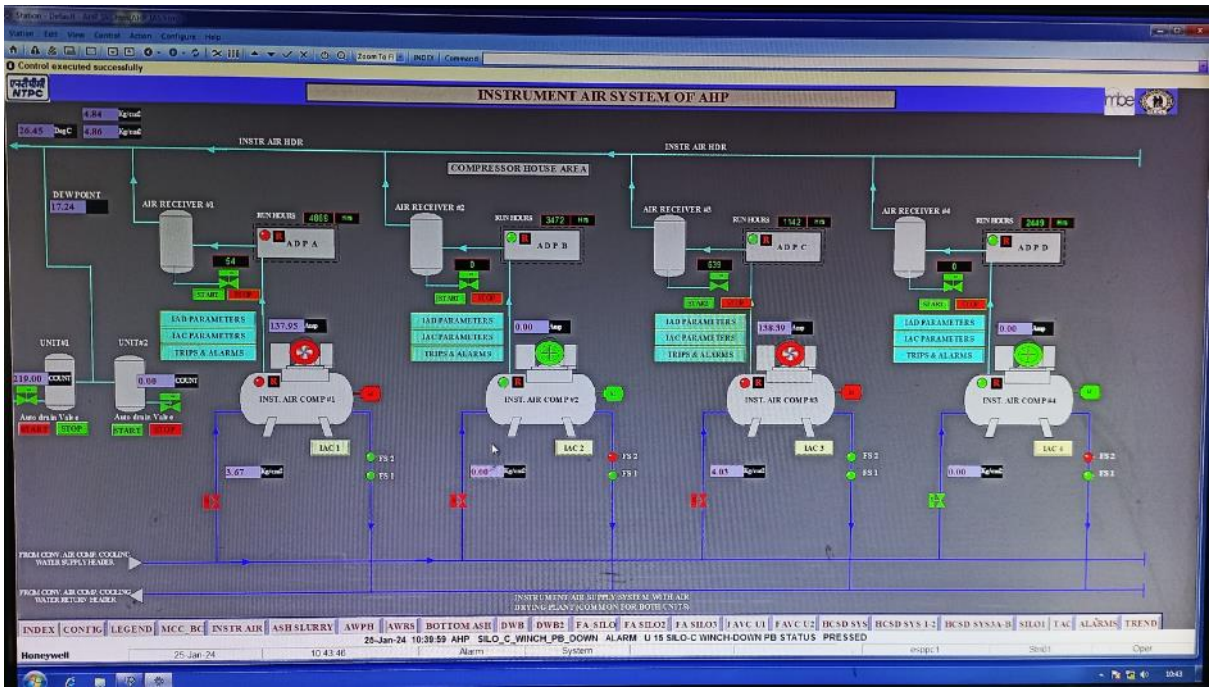
SAC B:

- ✓ The FAD test for SAC A is calculated to be 2086 CFM which is 4% deviation from rated value 2177 CFM.
- ✓ The actual SEC is calculated to be 0.211 kW/CFM which is 2% deviation from rated value of 0.21 kW/CFM.

8.2 Ash Handling plant:

8.2.1 Instrument air compressor:

The plant installed four number instrument air compressors for pneumatic purposes. At present two IAC are in running condition and two IAC are in stand by condition.



The Instrument air compressor details are as follows:

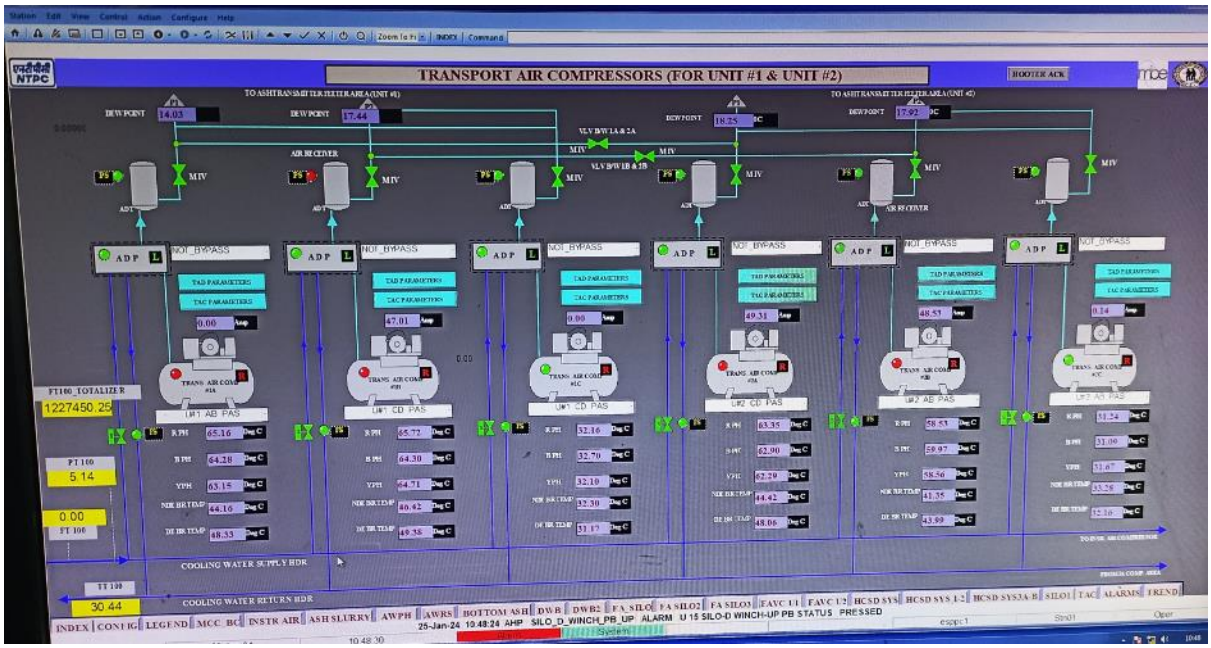
Parameters	Unit	IAC 1A	IAC 2A	IAC 2B
Load hrs	Hrs	45344	31174	34881
Unload hours	Hrs	176	569	250
Run hours	Hrs	45515	31690	35113
Stop	Nos	7745	16776	10505
Cut in pressure	Bar	6	6.5	6.5
Cut off pressure	Bar	7.5	8	8
Actual pressure	Bar	5.12	4.95	Off

Remarks:

- ✓ The average cut in pressure is set to 6.5 bar and cut off pressure is set to 8 bar.
- ✓ It was observed that compressor was running continuously and unloading hours are very less.
- ✓ The compressed air from IAC is supplied to Ash silo which is around 2 km away from the Ash handling system which leads to pressure drop and pressure is set to 8 bar at AHP end.

8.2.2 Transfer Air compressor:

The plant has installed three number of transfer air compressors for ash transferring system. At present there are two compressors running condition and one compressor is in stand by condition.



Parameters	Unit	1A	1B	1C	2A	2B	2C
Operating Hours	Hrs	42331	38246	34500	39648	36270	40573
On Load Hours	Hrs	42235	38122	34409	39530	36213	40489
Idle Hours	Hrs	95	124	91	117	56	84
Actual pressure	bar	0.4	0.95	0ff	0.7	1.01	off

Remarks:

- ✓ The average cut in pressure is set to 1.5 bar and cut off pressure is set to 2 bar.
- ✓ The actual average pressure output is around 1 bar.
- ✓ It was observed that compressor was running continuously and unloading hours are very less.
- ✓ Air Dryer is available for TAC, but it is in OFF condition to reduce energy consumption which is good.

8.2.3 Pump performance:

The pump performance has been carried out and details are as follows:

Pump Name	Unit	HP water pump A	LP water pump A	Flushing water pump	Ash slurry pump A	Ash slurry pump C
Rated Flow rate	m^3/hr	465	600	760	760	760
Rated Power	kW	300	75	45	200	200
Rated head	m	130	24	10	35	35
Measured Flow rate	m^3/hr	356.8	404.8	521.6	548.7	736.5
Measured Power	kW	264.8	45.0	28.4	147.0	182.0
Suction head	m	0.0	0.0	0.0	0.0	0.0
Delivery head	m	125.5	23.3	6.3	33.0	35.0
Total head (Hd-Hs)	m	125.5	23.3	6.3	33.0	35.0
Motor rated efficiency	%	94	94	94	95	95
Density	kg/m^3	1000	1000	1000	1000	1000
Hydraulic power	kW	122.0	25.7	9.0	49.3	70.2
Pump shaft power	kW	248.9	42.3	26.7	139.7	172.9
Pump efficiency	%	**49**	**61**	**34**	**35**	**41**

Remarks:

HP water pump A

- ✓ The pump efficiency of HP water pump A is calculated to be 49%.
- ✓ The pump efficiency of LP water pump A is calculated to be 61%.
- ✓ The pump efficiency of Flushing water pump is calculated to be 34%.
- ✓ The pump efficiency of Ash slurry pump A is calculated to be 35%.
- ✓ The pump efficiency of Ash slurry pump C is calculated to be 41%.
- ✓ The efficiency of the pump is lower due to the pump operating away from best efficiency point and also recommended to do regular maintenance to improve the performance of pump.

8.2.4 Motor power measurement:

The AHP motor power measurement is carried out and details are as follows:

S. No	Motor details	Rated capacity, kW	Motor Efficiency	Measured Voltage, V	Measured Current, A	Measured Power, kW	Power factor	Motor Loading, %
1	Slurry Pump A1	200	95	420	237.3	147	0.85	70
2	Slurry pump C1	200	95	429	166.7	88	0.71	42
3	Slurry pump C2	200	95	429	203.7	124	0.82	59
4	IAC C	110	95	429	140.0	94	0.90	81
5	IAC A	110	95	429	138.0	92	0.90	80
6	TAC 4	400	95	3346	41.3	232	0.85	55
7	TAC 2	400	95	3346	40.0	193	0.81	46
8	TAC 5	400	95	3346	47.3	239	0.85	57
9	TAC 1	400	95	3346	39.3	204	0.83	48
10	Hp water pump B	300	95	3346	58.0	298	0.85	94
11	Hp water pump A	300	95	3346	49.3	238	0.81	75
12	LP water pump B - 2	75	95	3346	72.8	45	0.11	57

Remarks:

The motor loading of the AHP is above 40% which is found satisfactory.

8.3 Electrostatic precipitator (ESP)

The plant has installed ESP capable of handling a gas flow rate of 905.6 m3/sec. The ESP has 72 Rectifier transformer of 95 kV DC output. Two phase supply is given to each rectifier transformer and DC output is given to the field and ESP has A, B, C, D pass with 9 Field in each pass of total 72 fields.

The electrostatic precipitator controller performance has been checked and details are as follows:

Unit 1:

Location	IS, %	CR	Location	IS, %	CR
Pass A			Pass B		
1A11	10	11	1B11	10	11
2A11	20	21	2B11	20	21
3A11	30	31	3B11	30	31
4A11	50	41	4B11	50	41
5A11	50	51	5B11	50	51
6A11	70	61	6B11	70	61
7A11	100	71	7B11	100	71
8A11	110	131	8B11	100	131
9A11	110	141	9B11	110	141
1A21	10	11	1B21	10	11
2A21	20	21	2B21	20	21
3A21	30	31	3B21	30	31
4A21	50	41	4B21	50	41
5A21	50	51	5B21	50	51
6A21	70	61	6B21	70	61
7A21	100	71	7B21	100	71
8A21	110	131	8B21	110	131
9A21	110	141	9B21	110	141

Location	IS, %	CR	Location	IS, %	CR
PASS C			PASS D		
1C11	10	11	1D11	10	11
2C11	20	21	2D11	20	21
3C11	30	31	3D11	30	31
4C11	40	31	4D11	50	41
5C11	40	51	5D11	50	51
6C11	50	51	6D11	60	61
7C11	100	71	7D11	100	71
8C11	110	131	8D11	110	131
9C11	110	141	9D11	110	141
1C21	10	11	1D21	10	11
2C21	20	21	2D21	20	21
3C21	30	31	3D21	30	31
4C21	50	41	4D21	50	41
5C21	50	51	5D21	50	51
6C21	70	61	6D21	70	61
7C21	100	71	7D21	100	71
8C21	110	131	8D21	110	131
9C21	110	141	9D21	110	141

Remarks: The ARECA controller setting is found to be satisfactory**.**

Unit 2:

Location	IS, %	CR	Location	IS, %	CR
PASS A			**PASS B**		
1A11	10	11	1B11	10	11
2A11	20	21	2B11	20	21
3A11	30	31	3B11	30	31
4A11	50	41	4B11	50	41
5A11	50	51	5B11	50	51
6A11	70	61	6B11	70	61
7A11	100	71	7B11	100	71
8A11	110	131	8B11	110	131
9A11	110	141	9B11	110	141
1A21	10	11	1B21	10	11
2A21	20	21	2B21	20	21
3A21	30	31	3B21	30	31
4A21	50	41	4B21	50	41
5A21	50	51	5B21	50	51
6A21	70	61	6B21	70	61
7A21	100	71	7B21	100	71
8A21	110	131	8B21	110	131
9A21	110	141	9B21	110	141
			Location	**IS, %**	**CR**

Location	IS, %	CR	Location	IS, %	CR
PASS C			**PASS D**		
1C11	10	11	1D11	10	11
2C11	20	21	2D11	20	21
3C11	30	31	3D11	30	31
4C11	50	41	4D11	50	41
5C11	50	51	5D11	50	51
6C11	70	61	6D11	70	61
7C11	100	71	7D11	100	71
8C11	110	131	8D11	110	131
9C11	110	141	9D11	110	141
1C21	10	11	1D21	10	11
2C21	20	21	2D21	20	21
3C21	30	31	3D21	30	31
4C21	50	41	4D21	50	41
5C21	50	51	5D21	50	51
6C21	70	61	6D21	70	61
7C21	100	71	7D21	100	71
8C21	110	131	8D21	110	131
9C21	110	141	9D21	110	141

Remarks:

The ARECA controller setting is found to be satisfactory**.**

Transformer power details:

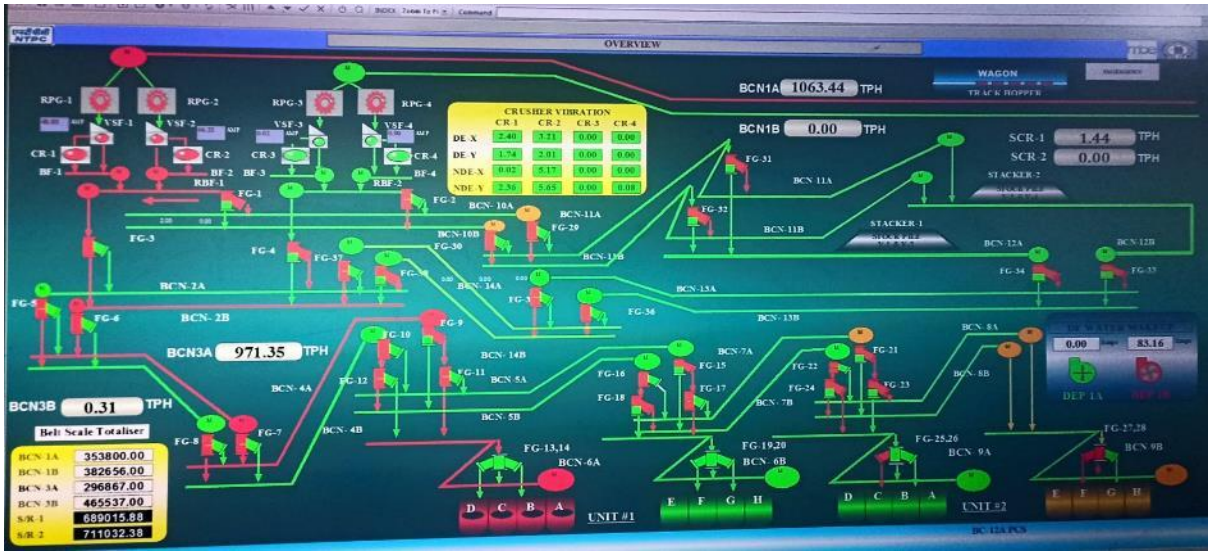
S. No	Location	Voltage, V	Current, A	Apparent power, kVA
		Unit 1		
1	LTMSB-A Pass incomer 1	433	230	58
		434	287	72
		432	260	65
2	LTMSB-A Pass incomer 2	430	400	99
		431	398	99
		433	394	99
3	LTMSB-B Pass incomer 1	432	276	69
		433	279	70
		434	249	62
4	LTMSB-B Pass incomer 2	434	297	74
		437	295	74
		434	291	73
5	LTMSB-C Pass incomer 1	433	281	70
		432	311	78
		431	301	75
6	LTMSB-C Pass incomer 2	437	280	71
		437	297	75
		438	311	79
7	LTMSB-D Pass incomer 1	433	299	75
		435	256	64
		430	295	73
8	LTMSB-D Pass incomer 2	436	322	81
		436	313	79
		434	300	75

S. No	Location	Voltage, V	Current, A	Apparent power, kVA
Unit 2				
1	LTMSB-A Pass incomer 1	455	340	89
		454	335	88
		453	351	92
2	LTMSB-A Pass incomer 2	450	301	78
		451	311	81
		448	309	80
3	LTMSB-B Pass incomer 1	455	307	81
		456	308	81
		454	309	81
4	LTMSB-B Pass incomer 2	450	305	79
		448	302	78
		448	290	75
5	LTMSB-C Pass incomer 1	450	315	82
		456	298	78
		452	334	87
6	LTMSB-C Pass incomer 2	449	360	93
		449	367	95
		447	374	97
7	LTMSB-D Pass incomer 1	440	300	76
		445	298	77
		444	305	78
8	LTMSB-D Pass incomer 2	440	320	81
		449	326	85
		446	337	87

8.4 Coal handling plant:

The plant has installed a Coal handling plant to transfer the coal from yard to bunker.

The coal from the wagon is unloaded through Wagon track hoppers and send to RPG through BCN1A. BCN 10 A and B are used to transfer the coal to stacker storage area and BCN 2A and B are used for direct bunkering.



Motor power measurement:

The CHP major load measurement is carried out and details are as follows.

S. No	Motor details	Rated capacity, kW	Motor Efficiency	Measured Voltage, V	Measured Current, A	Measured Power, kW	Power factor	Motor Loading, %
				HT Motor				
1	Conveyor-1A	520.0	85.0	3300	67.00	268.06	0.70	44
2	Conveyor-3A	430.0	85.0	3300	57.00	247.60	0.76	49
3	Conveyor-4A	240.0	85.0	3300	27.00	114.20	0.74	40
4	Crusher-1	550.0	85.0	3300	74.00	198.79	0.47	31
5	Crusher-2	550.0	85.0	3300	69.00	134.09	0.34	21
6	Conveyor-2B	200.0	85.0	3300	24.00	96.02	0.70	41
				LT Motor				
7	Air Compressor	90.0	85.0	415	120.00	60.38	0.70	57
8	Dust Extraction fan	160.0	85.0	415	120.00	60.38	0.70	32
9	Vibrating screen feeder-1	45.0	85.0	415	36.00	18.11	0.70	34
10	Vibrating screen feeder-2	45.0	85.0	415	40.00	20.13	0.70	38
11	Cooling water pump	75.0	85.0	415	100.00	50.31	0.70	57
12	Reversible belt feeder	37.0	85.0	415	28.00	14.09	0.70	32

8.5 Water treatment Plant

8.5.1 Motor loading:

The water treatment plant motor loading details are as follows.

S. No	Motor details	Rated capacity, kW	Motor Efficiency	Measured Voltage, V	Measured Current, A	Measured Power, kW	Power factor	Motor Loading, %
1	DM water makeup pump	45	85.0	415	66.37	44.84	0.94	84.70
2	Service water pump	175	85.0	416	228.00	156.06	0.95	75.80
3	Filter water supply pump A	22	85.0	414	30.50	20.34	0.93	78.58
4	Portable water pump	55	85.0	417	76.80	50.48	0.91	78.01
5	HVAC makeup pump	55	85.0	413	53.90	36.63	0.95	56.61
6	Degasser pump	30	85.0	415	42.00	28.38	0.94	80.40

Remarks:

- ✓ The motor loading is found to be satisfactory.

8.5.2 Pump performance:

The pump performance details are as follows.

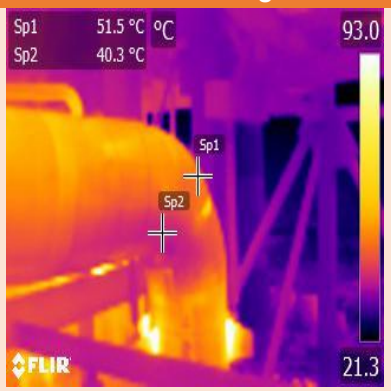
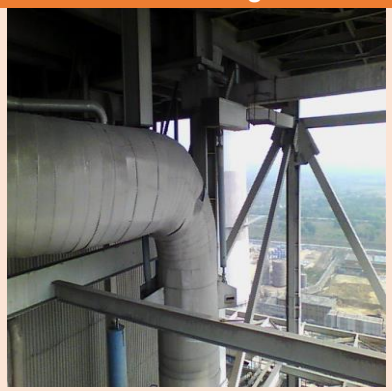
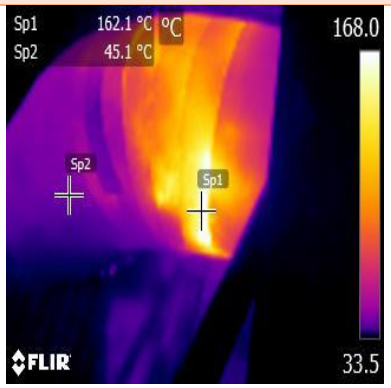
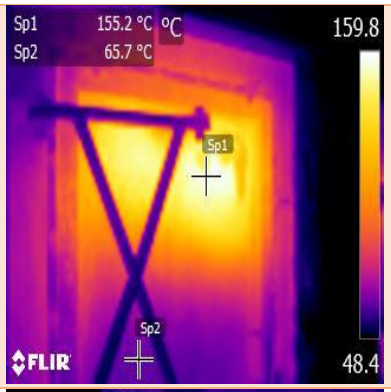
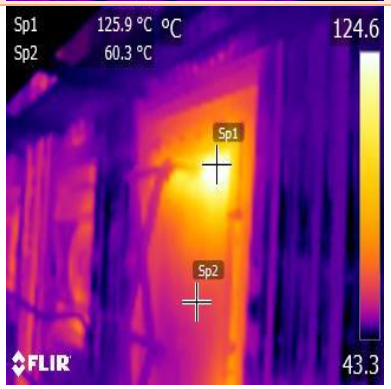
Pump Name	Unit	Raw water pump	Degasser pump
Measured Flow rate	m^3/hr	2230.0	87.9
Measured Power	kW	142.8	28.7
Suction head	m	11.0	3
Delivery head	m	17.6	56.7
Total head (Hd-Hs)	m	6.6	53.7
Motor rated efficiency	%	85	85
Density	kg/m^3	1000	1000
Hydraulic power	kW	40.1	12.9
Pump shaft power	kW	121.4	24.4
Pump efficiency	%	**33**	**53**

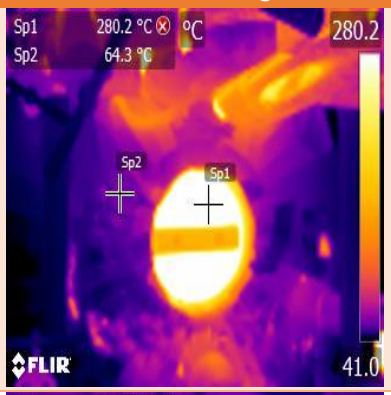
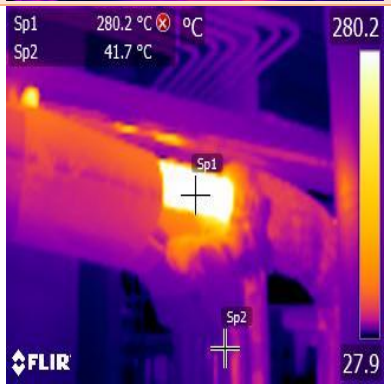
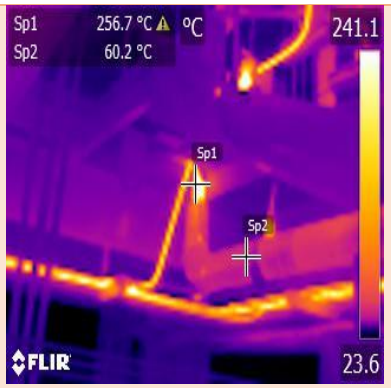
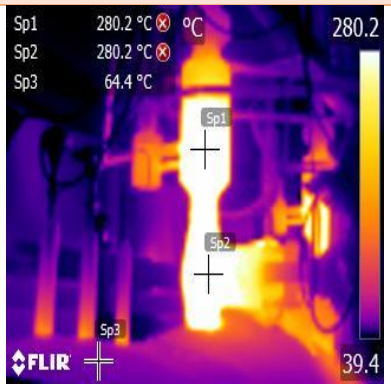
Remarks:

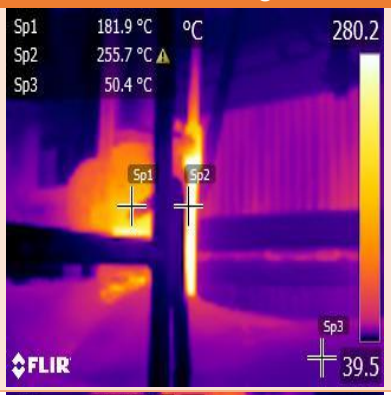
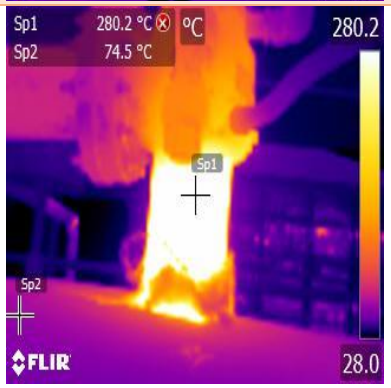
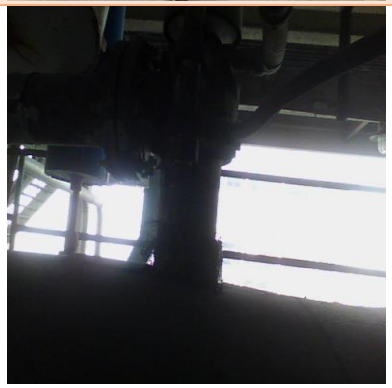
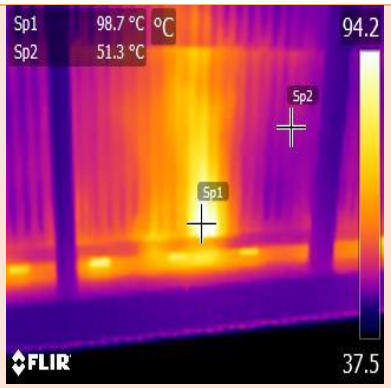
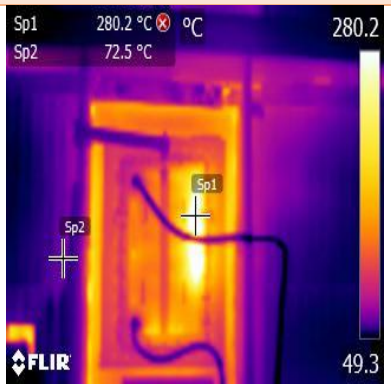
- ✓ Raw water pump efficiency is calculated to be 33% and Degasser pump efficiency is calculated 53%.
- ✓ It is recommended to do regular maintenance to improve efficiency.

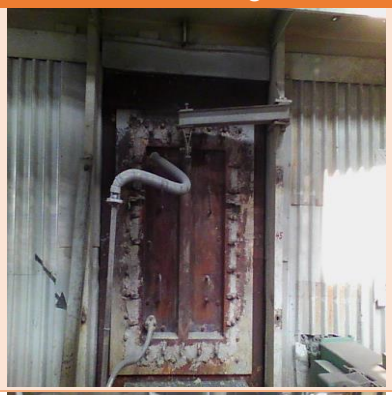
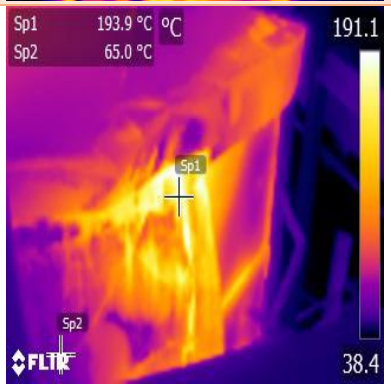
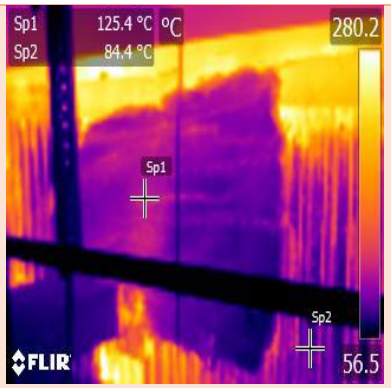
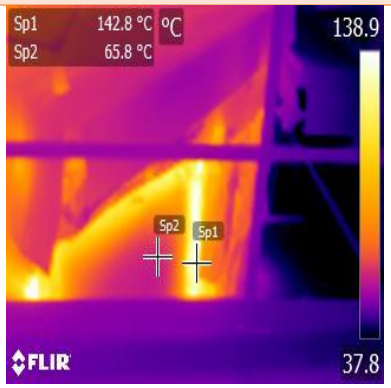
8.6 Steam line insulation:

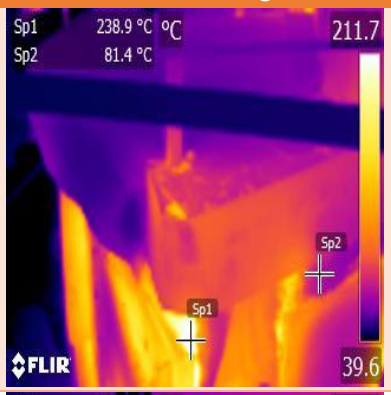
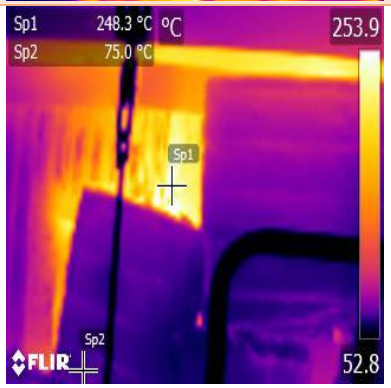
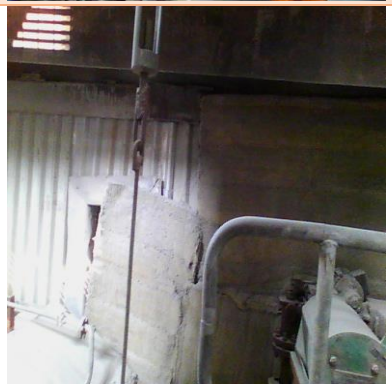
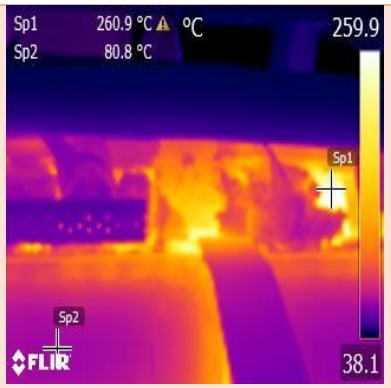
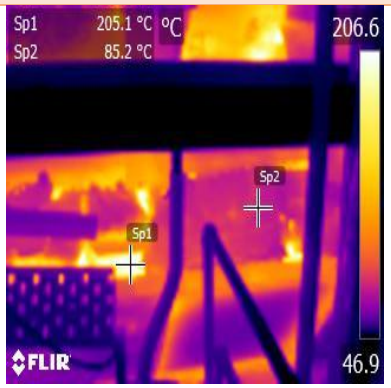
Steam line insulation survey has been carried out using Infrared Thermographic camera and details are as follows:

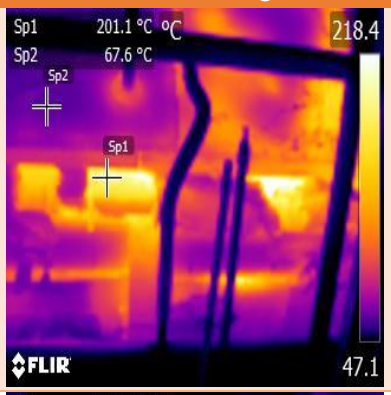
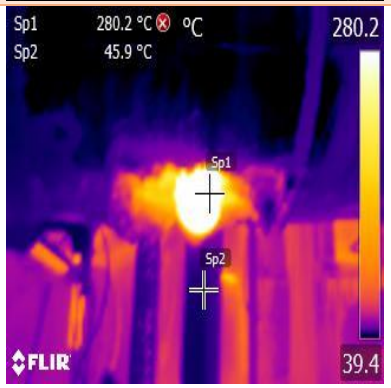
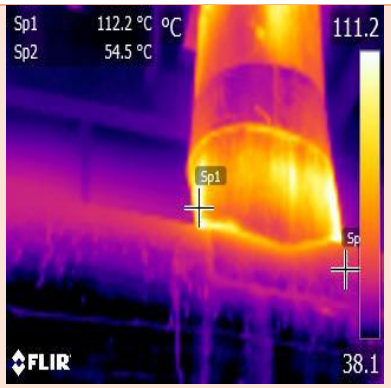
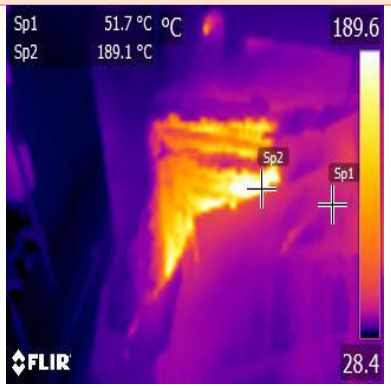
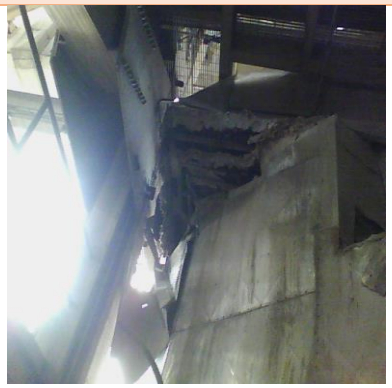
S. No	Location	Thermal Image	Visual Image	Remarks
1	Boiler Unit-1_ Boiler top_ HRH Line bend.			Insulation damage condition. It is recommended to reinsulate the area
2	Boiler Unit-1_ 82 Meter_ CRH Line.			Insulation damage condition. It is recommended to reinsulate the area
3	Boiler Unit-1_ 78 Meter_ Manhole Right side Penthouse.			Insulation damage condition. It is recommended to reinsulate the area
4	Boiler Unit-1_ 78 Meter_ Manhole Left side Penthouse.			Insulation damage condition. It is recommended to reinsulate the area

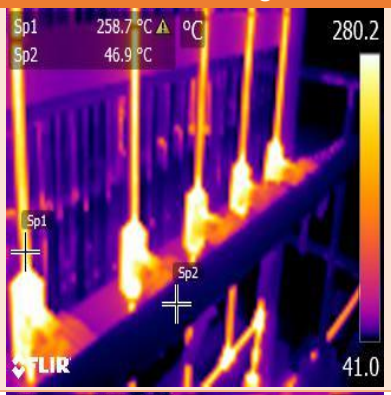
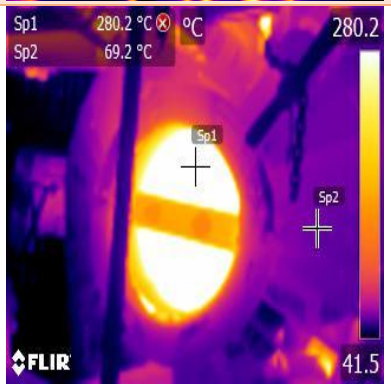
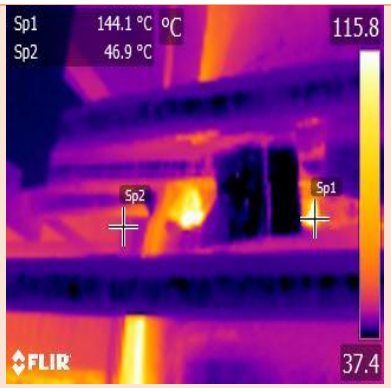
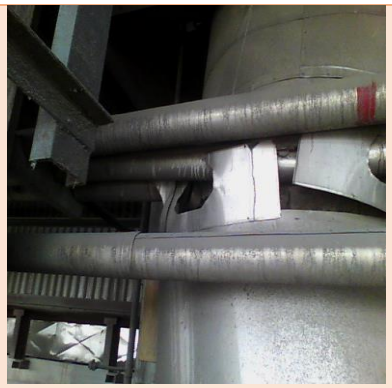
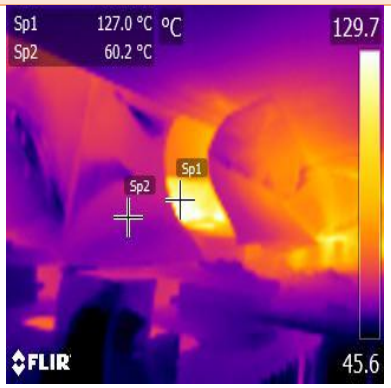
S. No	Location	Thermal Image	Visual Image	Remarks
5	Boiler Unit-1_ 78 Meter_ Boiler drum Manhole both sides.			No Insulation in this area. It is recommended to insulate the area
6	Boiler Unit-1_ 76 Meter_ IBT & CBT drain line.			Insulation damage condition. It is recommended to reinsulate the area
7	Boiler Unit-1_ 76 Meter_ IBT & CBT drain line bend up.			Insulation damage condition. It is recommended to reinsulate the area
8	Boiler Unit-1_ 72.9 Meter_ ERV S15 Right-side.			No Insulation in this area. It is recommended to insulate the area

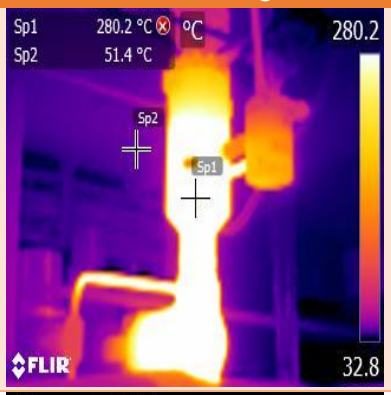
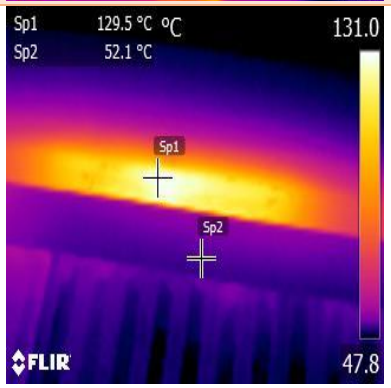
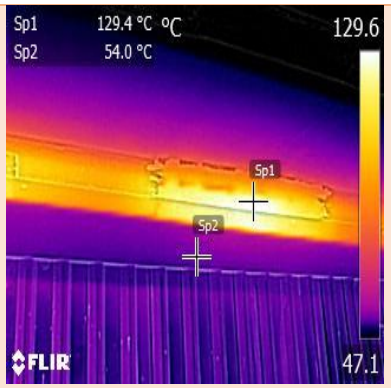
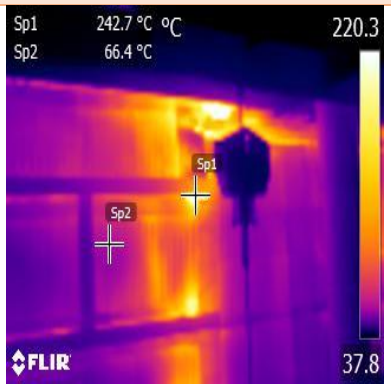
S. No	Location	Thermal Image	Visual Image	Remarks
9	Boiler Unit-1_ 72.9 Meter_ Sampling line Right-side.			No Insulation in this area. It is recommended to insulate the area
10	Boiler Unit-1_ 72.9 Meter_ Mainstream safety value.			No Insulation in this area. It is recommended to insulate the area
11	Boiler Unit-1_ 59.5 Meter_ Right-side Boiler corner Sheet-4.			Insulation damage condition. It is recommended to reinsulate the area
12	Boiler Unit-1_ 55 Meter_ Elephant door_ Left side.			Insulation damage condition. It is recommended to reinsulate the area

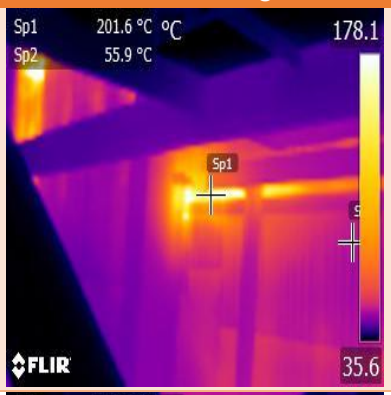
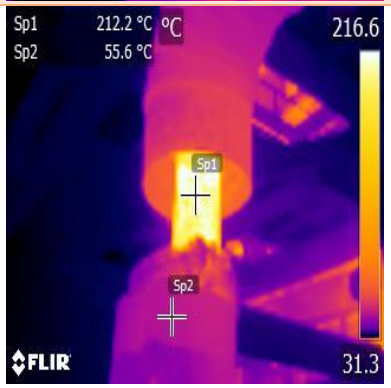
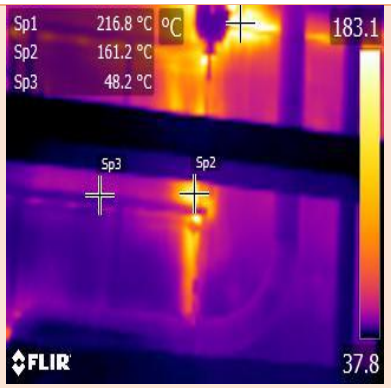
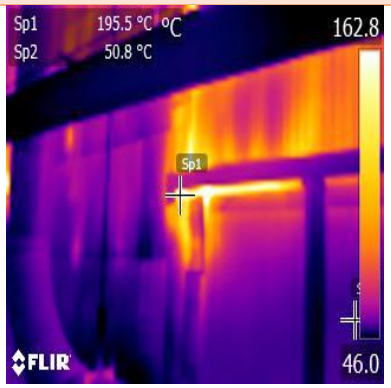
S. No	Location	Thermal Image	Visual Image	Remarks
13	Boiler Unit-1_ 55 Meter_ Elephant door_ Right-side.			Insulation damage condition. It is recommended to reinsulate the area
14	Boiler Unit-1_ 33 Meter_ Corner-1_ Burner top left side.			Insulation damage condition. It is recommended to reinsulate the area
15	Boiler Unit-1_ 33 Meter_ WB-62_ Left side.			Insulation damage condition. It is recommended to reinsulate the area
16	Boiler Unit-1_ 33 Meter_ Corner-2_ Burner top left side.			Insulation damage condition. It is recommended to reinsulate the area

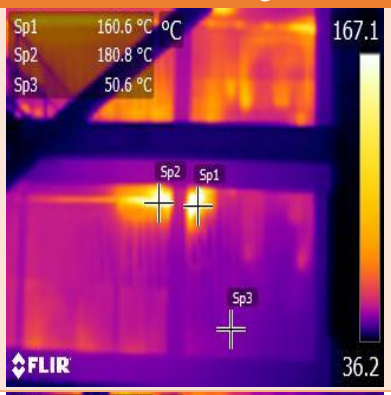
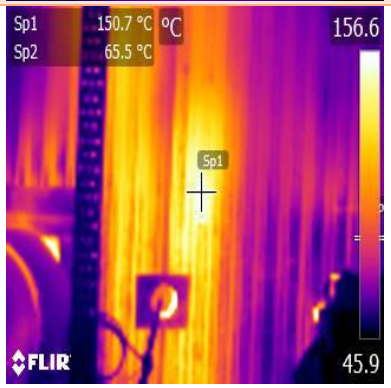
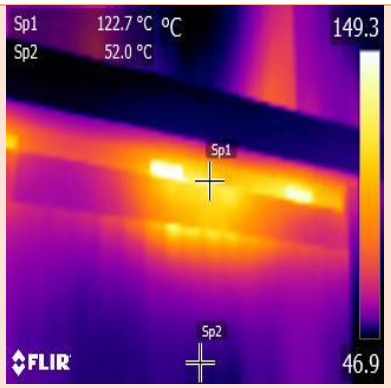
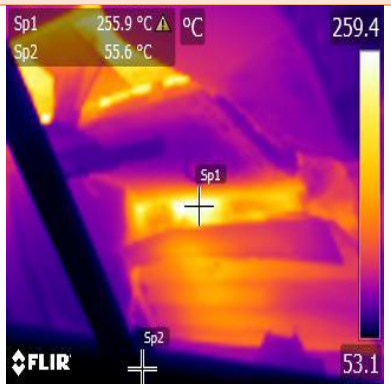
S. No	Location	Thermal Image	Visual Image	Remarks
17	Boiler Unit-1_ 33 Meter_ Corner-3_ Burner top left side.			Insulation damage condition. It is recommended to reinsulate the area
18	Boiler Unit-1_ 33 Meter_ WB-51_ Right-side.			Insulation damage condition. It is recommended to reinsulate the area
19	Boiler Unit-1_ 40 Meter_ Burner corner-1_ Left side.			Insulation damage condition. It is recommended to reinsulate the area
20	Boiler Unit-1_ 40 Meter_ Burner corner-2_ Left side.			Insulation damage condition. It is recommended to reinsulate the area

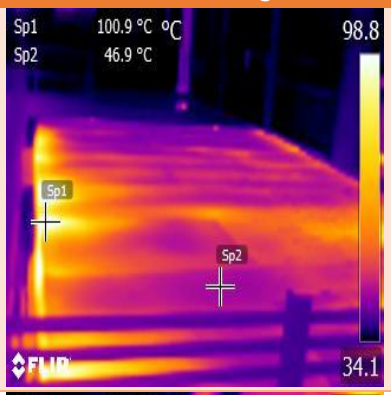
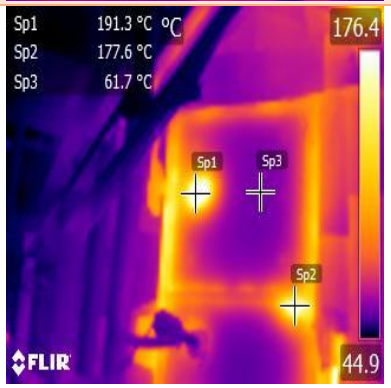
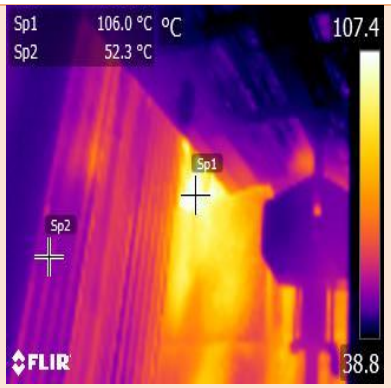
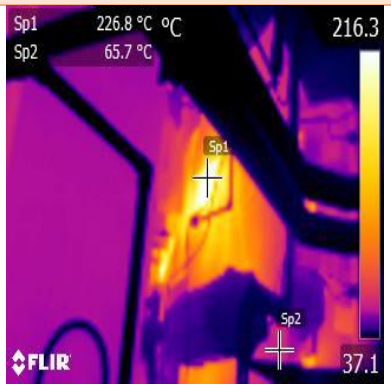
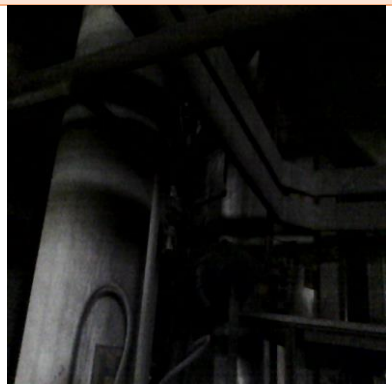
S. No	Location	Thermal Image	Visual Image	Remarks
21	Boiler Unit-1_ 40 Meter_ Burner corner-3_ Right-side.			Insulation damage condition. It is recommended to reinsulate the area
22	Boiler Unit-1_ 30 Meter_ Down comer line_ Header cap.			No Insulation in this area. It is recommended to insulate the area
23	Boiler Unit-1_ 30 Meter_ Down comer line_ Down comer Joint left side.			Insulation damage condition. It is recommended to reinsulate the area
24	Boiler Unit-1_ 22 Meter_ APH Agra corner-1.			Insulation damage condition. It is recommended to reinsulate the area

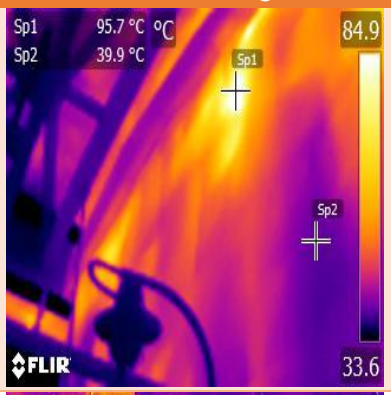
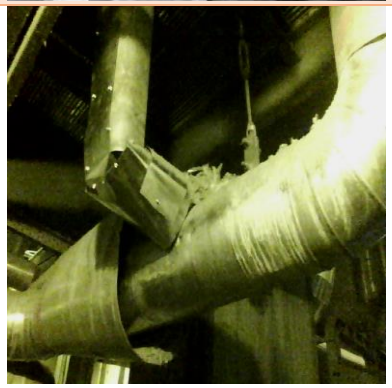
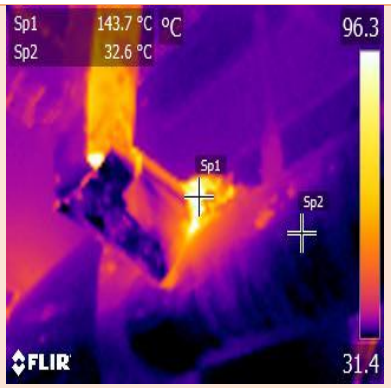
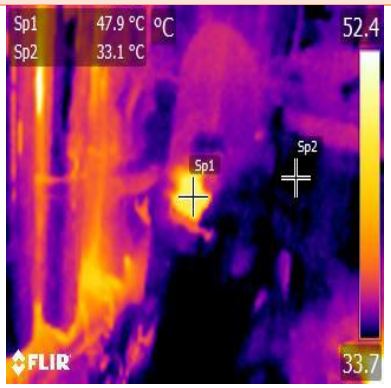
S. No	Location	Thermal Image	Visual Image	Remarks
25	Boiler Unit-2_ 79.3 Meter_ Sampling left side.			No Insulation in this area. It is recommended to insulate the area
26	Boiler Unit-2_ 79.3 Meter_ Drum Manhole both sides.			No Insulation in this area. It is recommended to insulate the area
27	Boiler Unit-2_ 76 Meter_ Main streamline.			Insulation damage condition. It is recommended to reinsulate the area
28	Boiler Unit-2_ 76 Meter_ Corner-4_ Right-side.			Insulation damage condition. It is recommended to reinsulate the area

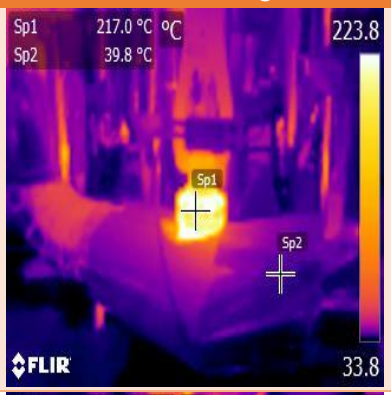
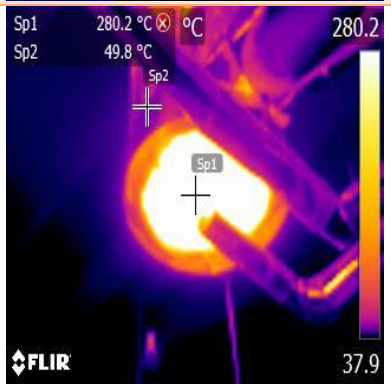
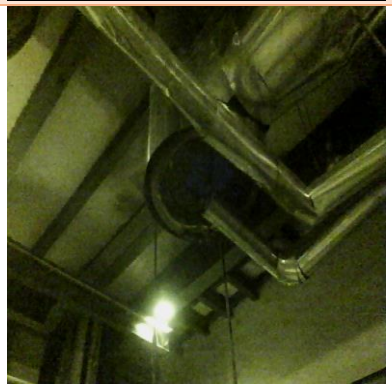
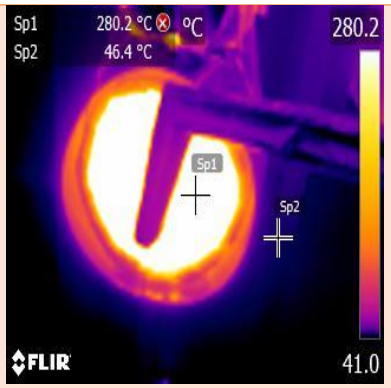
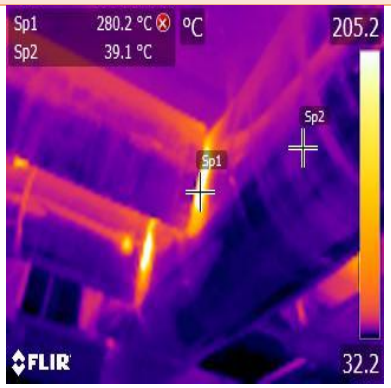
S. No	Location	Thermal Image	Visual Image	Remarks
29	Boiler Unit-2_ 72.9 Meter_ Mainstream line safety value.			No Insulation in this area. It is recommended to insulate the area
30	Boiler Unit-2_ 69 Meter_ Boiler_ Left side.			Insulation damage condition. It is recommended to reinsulate the area
31	Boiler Unit-2_ 69 Meter_ Boiler_ Right-side.			Insulation damage condition. It is recommended to reinsulate the area
32	Boiler Unit-2_ 66.4 Meter_ Boiler_ Left side.			Insulation damage condition. It is recommended to reinsulate the area

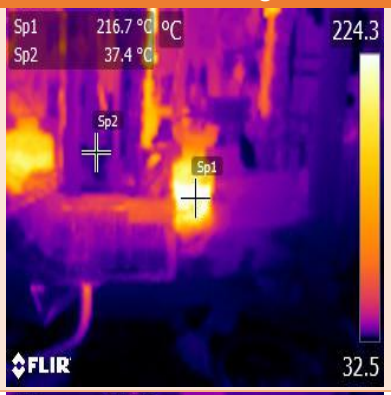
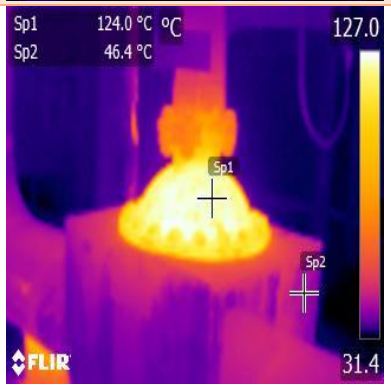
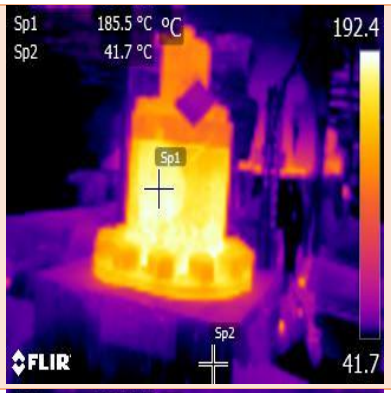
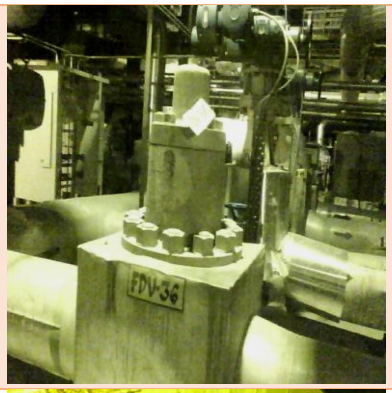
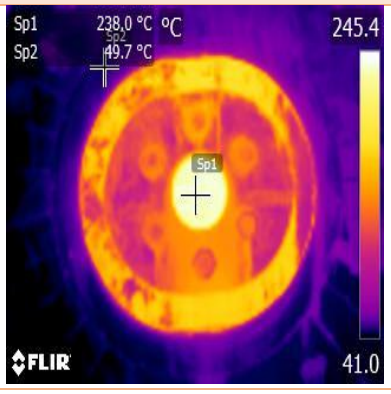
S. No	Location	Thermal Image	Visual Image	Remarks
33	Boiler Unit-2_ 59.5 Meter_ Boiler_ Left side.			Insulation damage condition. It is recommended to reinsulate the area
34	Boiler Unit-2_ 59.5 Meter_ LRS Streamline.			Insulation damage condition. It is recommended to reinsulate the area
35	Boiler Unit-2_ 59.5 Meter_ Boiler Left side.			Insulation damage condition. It is recommended to reinsulate the area
36	Boiler Unit-2_ 59.5 Meter_ Boiler Right-side.			Insulation damage condition. It is recommended to reinsulate the area

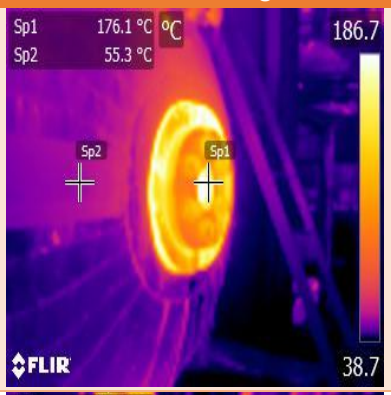
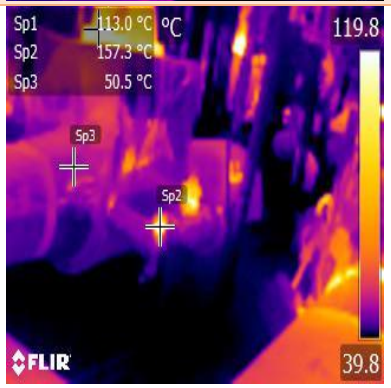
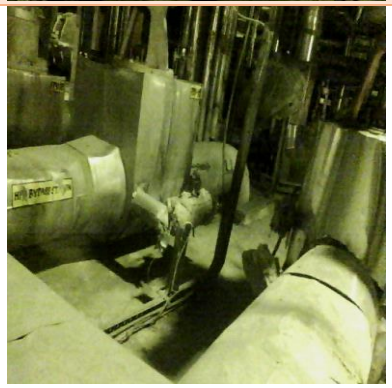
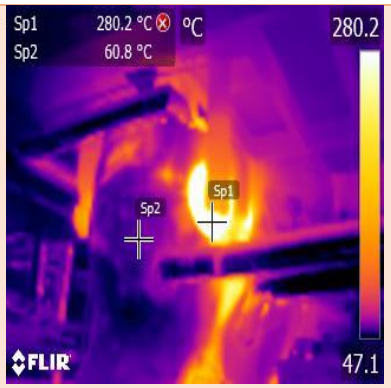
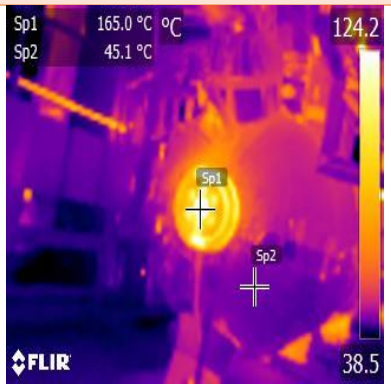
S. No	Location	Thermal Image	Visual Image	Remarks
37	Boiler Unit-2_ 59.5 Meter_ Boiler Right-side.			Insulation damage condition. It is recommended to reinsulate the area
38	Boiler Unit-2_ 56 Meter_ Boiler Right-side.			Insulation damage condition. It is recommended to reinsulate the area
39	Boiler Unit-2_ 46 Meter_ Boiler Left side.			Insulation damage condition. It is recommended to reinsulate the area
40	Boiler Unit-2_ 46 Meter_ Corner-1 Burner top.			Insulation damage condition. It is recommended to reinsulate the area

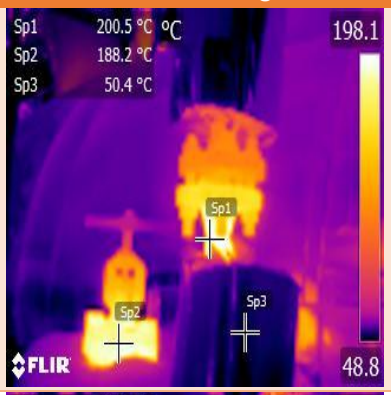
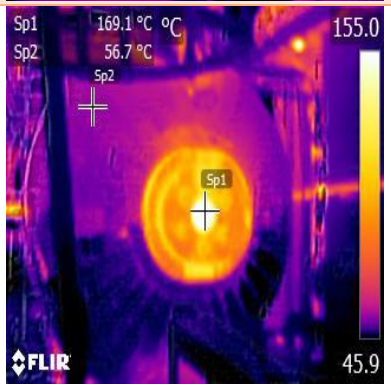
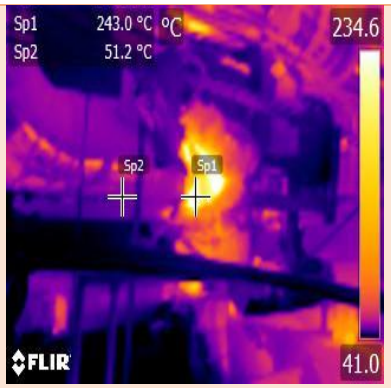
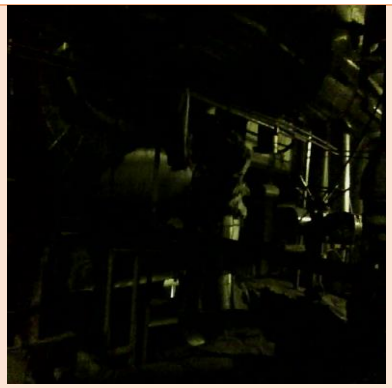
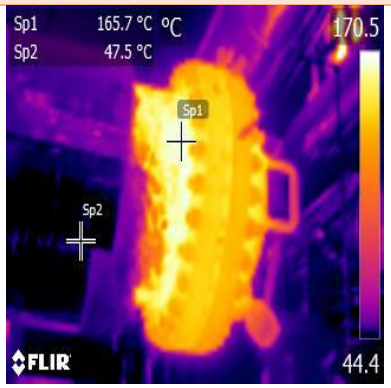
S. No	Location	Thermal Image	Visual Image	Remarks
41	Boiler Unit-2_ 42 Meter_ APH line Left side.			Insulation damage condition. It is recommended to reinsulate the area
42	Boiler Unit-2_ 42 Meter_ Burner Corner-4.			Insulation damage condition. It is recommended to reinsulate the area
43	Boiler Unit-2_ 32 Meter_ APH Inlet Duct.			Insulation damage condition. It is recommended to reinsulate the area
44	Boiler Unit-2_ 30 Meter_ Corner-2_ Cooling line.			Insulation damage condition. It is recommended to reinsulate the area

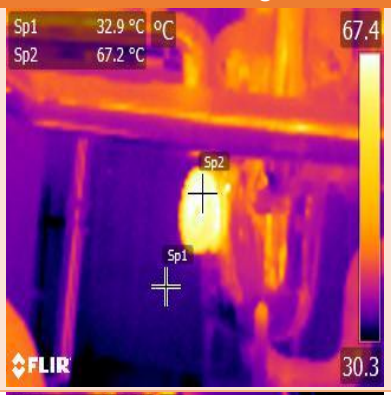
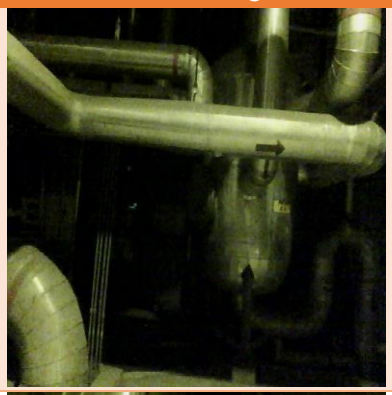
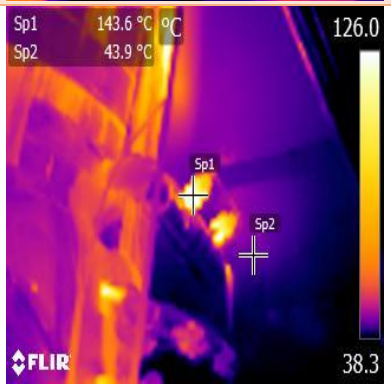
S. No	Location	Thermal Image	Visual Image	Remarks
45	Boiler Unit-2_ 30 Meter_ Corner-3_ Cooling line.			Insulation damage condition. It is recommended to reinsulate the area
46	Boiler Unit-2_ 30 Meter_ CCW Pump line.			Insulation damage condition. It is recommended to reinsulate the area
47	Turbine Unit-1_ zero meter_ HRH Drain line with LPH-2D Joint.			Insulation damage condition. It is recommended to reinsulate the area
48	Turbine Unit-1_ zero meter_ Flash tank-A_ Inlet.			Insulation damage condition. It is recommended to reinsulate the area

S. No	Location	Thermal Image	Visual Image	Remarks
49	Turbine Unit-1_ zero meter_ HPHD-7A Pipeline.			Insulation damage condition. It is recommended to reinsulate the area
50	Turbine Unit-2_ zero meter_ MS Turner.			No Insulation in this area. It is recommended to insulate the area
51	Turbine Unit-2_ zero meter_ MS Turner.			No Insulation in this area. It is recommended to insulate the area
52	Turbine Unit-2_ zero meter_ Mainstream line joint.			Insulation damage condition. It is recommended to reinsulate the area

S. No	Location	Thermal Image	Visual Image	Remarks
53	Turbine Unit-2_ zero meter_ DRV-55 Value.			No Insulation in this area. It is recommended to insulate the area
54	Turbine Unit-2_ 8.5 meter_ CDV-35 Value.			No Insulation in this area. It is recommended to insulate the area
55	Turbine Unit-2_ 8.5 meter_ FDV-36 Value.			No Insulation in this area. It is recommended to insulate the area
56	Turbine Unit-2_ 8.5 meter_ HPH-7A_ Manhole.			No Insulation in this area. It is recommended to insulate the area

S. No	Location	Thermal Image	Visual Image	Remarks
57	Turbine Unit-2_ 8.5 meter_ HPH-7B_ Manhole.			No Insulation in this area. It is recommended to insulate the area
58	Turbine Unit-2_ 8.5 meter_ HPH Bypass Small Value.			Insulation damage condition. It is recommended to reinsulate the area
59	Turbine Unit-2_ thirteen meters_ ASV-1 Small pipeline.			No Insulation in this area. It is recommended to insulate the area
60	Turbine Unit-1_ 13 meters_ HPH-5A_ Manhole.			Insulation damage condition. It is recommended to reinsulate the area

S. No	Location	Thermal Image	Visual Image	Remarks
61	Turbine Unit-1_ 13 meters_ HPH-5B_ Vent.			No Insulation in this area. It is recommended to insulate the area
62	Turbine Unit-1_ 13 meters_ HPH_ Manhole.			No Insulation in this area. It is recommended to insulate the area
63	Turbine Unit-1_ 8.5 meter_ SFA Stream leak offline.			Insulation damage condition. It is recommended to reinsulate the area
64	Turbine Unit-1_ 8.5 meter_ To BFP-1B Conical strainer.			No Insulation in this area. It is recommended to insulate the area

S. No	Location	Thermal Image	Visual Image	Remarks
65	Turbine Unit-1_ 8.5 meter_ FW SVD F/T-Manhole.			Insulation damage condition. It is recommended to reinsulate the area
66	Turbine Unit-1_ 8.5 meter_ Hot Reheat line small sample line.			Insulation damage condition. It is recommended to reinsulate the area

8.7 Load measurement:

The motor power measurement is carried out and details are as follows.

Unit 1:

Equipment Name	Rated capacity, kW	Rated efficiency	Voltage, V	Measured current, A	Measured power, kW	% loading
ID fan A CH 1	1875	95	11000	78	1166	59.08
ID fan A CH2	1875	95	11000	73	1114	56.44
ID fan B CH 1	1875	95	11000	79	1185	60.04
ID fan B CH 2	1875	95	11000	81	1183	59.94
FD fan A	1350	95	3300	165	764	53.76
FD fan B	1350	95	3300	162	777	54.68
PA fan A	3200	95	11000	73	1202	35.68
PA fan B	3200	95	11000	72	1176	34.91
Mill A	680	95	3300	128	520	72.65
Mill B	680	95	3300	145	581	81.17
Mill C	680	95	3300	121	465	64.96
Mill D	680	95	3300	143	595	83.13
Mill E	680	95	3300	124	503	70.27
Mill G	680	95	3300	143	579	80.88
BCW Pump 1A	450	95	3300	90	282	59.53
CEP 1A	1150	95	3300	182	991	81.87
CEP 1B	1150	95	3300	177	977	80.71
CW pump 1A	3600	95	11000	210	3164	83.49
CW pump 1B	3600	95	11000	211	3236	85.39
CW pump 1B	3600	95	11000	208	3142	82.91

Unit 2:

Equipment Name	Rated capacity, kW	Rated efficiency	Voltage, V	Measured current, A	Measured power, kW	Measured power factor, pf	% loading
ID fan A CH 1	1875	95	11000	84	1366	0.81	69.21
ID fan A CH2	1875	95	11000	82	1419	0.81	71.90
ID fan B CH 1	1875	95	11000	85	1450	0.83	73.47
ID fan B CH 2	1875	95	11000	77	1312	0.83	66.47
FD fan A	1350	95	3300	167	779	0.76	54.82
FD fan B	1350	95	3300	164	766	0.75	53.90
PA fan B	3200	95	11000	77	1282	0.83	38.06
PA fan A	3200	95	11000	73	1201	0.81	35.65
Mill A	680	95	3300	132	562	0.7	78.51
Mill C	680	95	3300	123	500	0.65	69.85
Mill D	680	95	3300	127	505	0.65	70.55

Equipment Name	Rated capacity, kW	Rated efficiency	Voltage, V	Measured current, A	Measured power, kW	Measured power factor, pf	% loading
Mill E	680	95	3300	134	566	0.69	79.07
Mill F	680	95	3300	139	580	0.72	81.03
BCW Pump 2A	450	95	3300	94	296	0.51	62.49
CEP 2A	1150	95	3300	184	993	0.88	82.03
CEP 2B	1150	95	3300	177	946	0.88	78.15
CW pump 2B	3600	95	11000	212	3140	0.75	82.86

8.8 Lux measurement:

The lux measurement is carried out using Lux meter in various locations and details are as follows.

S. No	Location	Average lux values	Standard lux values
1	Near Hydrovin streetlight.	28	100
2	DM plant-street light.	17	100
3	Near CHP Control room_ Street light.	18	100
4	Near CHP_ Street light.	15	100
5	Near Coagon_ Street light.	22	100
6	Service building Entrance streetlight.	31	100
7	TG boiler road.	43	100
8	Service building_ Third floor cabin.	257	300
9	17 Meter_ Turbine area_ U-1.	50	200
10	17 Meter_ Turbine area_ U-2.	268	200
11	17 Meter_ Turbine area_ UCB.	268	200
12	Unit-2_ Lift area.	23	100
13	Unit-2_ 22 Meters_ Boiler_ Near lift.	33	100
14	Unit-2_ 22 Meters_ Boiler_ Coal mill feeder floor.	41	100
15	Unit-2_ 26.45 Meters_ Boiler_ Coal mill feeder floor.	36	100
16	Unit-2_ 30 Meters_ Boiler_ Coal mill feeder floor.	45	100
17	Unit-2_ 32 Meters_ Turbine Dehydrate floor.	48	100
18	Unit-2_ 36 Meters_ Turbine Dehydrate floor.	46	100
19	Unit-2_ 34 Meters_ Boiler.	31	100
20	Unit-2_ 56 Meters_ 9th floor.	36	100
21	Unit-2_ 66 Meters_ 10th floor.	32	100
22	Unit-2_ 88 Meters_ 13th floor.	36	100
23	Unit-2_ 17 Meters_ Turbine HP.	56	100
24	Unit-2_ 9.3 Meters_ Boiler Unit-1.	59	100
25	Unit-2_ 8.5 Meters_ TG LP Heater.	20	100
26	Unit-2_ 8.5 Meters_ Cable gallery.	30	100
27	Unit-1_ Lift boiler.	258	100
28	Unit-1_ 17 Meter_ Boiler.	30	100
29	Unit-1_ 22 Meter_ Boiler.	24	100
30	Unit-1_ 26 Meter_ Boiler.	26	100
31	Unit-1_ 26 Meter_ Boiler.	55	100
32	Unit-1_ 34 Meter_ Dehydrate.	15	100
33	Unit-1_ 40 Meter_ Boiler.	26	100
34	Unit-1_ 58 Meter_ Boiler.	86	100
35	Unit-1_ 73 Meter_ Boiler.	45	100
36	Unit-1_ 0 Meter_ TG.	23	200
37	Unit-1_ 0 Meter_ Boiler unit-1&2 Intermediate Area.	44	100
38	Unit-2_ 0 Meter_ TG.	35	200
39	Unit-2_ 0 Meter_ TG.	30	200
40	Unit-1_ 0 Meter_ Boiler.	42	100
41	Unit-2_ 0 Meter_ Near air Receive tank.	23	100

Remarks: The lux lever is some areas. It is recommended to improve the lux level by installing additional lights.

8.9 HVAC system:

8.9.1 Vapour Absorption chiller:

The VAM of 220TR performance has been carried out and details are as follows.

Vapour Absorption Machine			
Parameters	**Units**	**Vapour Absorption Machine-1**	**Vapour Absorption Machine-2**
Chilled water inlet Temperature	Deg. C	12.5	12.6
Chilled water outlet Temperature	Deg. C	9.2	9.5
Chilled Water Flow Rate	m3/hr	140.0	140.0
Chilled Water Temperature Difference	Deg. C	3.3	3.1
Condenser (Cooling) inlet temperature	Deg. C	31.5	31.6
Condenser (Cooling) outlet temperature	Deg. C	35.1	34.8
Condenser (Cooling) Temperature Difference	Deg. C	3.6	3.2
Steam control valve opening	%	40.0	45.0
Steam Pressure	kg/cm2	5.0	6.0
Steam consumption	kg/hr	550.0	516.7
Steam temperature	°C	153.0	160.5
Enthalpy of steam	kcal/kg	658.3	659.8
Latent heat of steam	kcal/kg	498.7	493.9
Net Refrigerant **Capacity**	TR	**152.8**	**143.5**
TR deviation	%	30.56	34.76

Remarks:

- ✓ The TR of VAM 1 is calculated to be 152.8 TR which is 31% deviation from rated value 220 TR.
- ✓ The TR of VAM 2 is calculated to be 143.5 TR which is 35% deviation from rated value 220 TR.
- ✓ The TR is low which is mainly due to good ambient conditions (Winter season).

8.9.2 HVAC Cooling tower:

The cooling performance has been carried out and details are as follows.

Parameters	Unit	Cooling Tower 2	Cooling Tower 3	Cooling Tower 4	Cooling Tower 5
Cooling tower inlet temperature	° C	34.9	34.8	35.1	35.2
Cooling tower outlet temperature	° C	32	31.5	32	28
Wet bulb temperature	° C	21.7	21.7	21.7	21.7
Dry bulb temperature	° C	25.5	25.5	25.5	25.5
Range	° C	2.9	3.3	3.1	7
Approach	° C	10	10	10	6
Effectiveness	%	22.0	25.2	23.1	53.3

Remarks:

- ✓ The cooling effectiveness is calculated to be 22% for the cooling tower 2.
- ✓ The cooling effectiveness is calculated to be 25% for the cooling tower 3.
- ✓ The cooling effectiveness is calculated to be 23% for the cooling tower 4.
- ✓ The cooling effectiveness is calculated to be 53% for the cooling tower 5.

8.9.3 HVAC Pump performance.

The HVAC pump performance has been carried out and details are as follows.

Pump Name	Unit	Chilled water pump B	Chilled water pump E
Measured Flow rate	m^3/hr	140.0	140.0
Measured Power	kW	40.3	43.4
Suction head	m	30.0	25.0
Delivery head	m	59.0	66.0
Total head (Hd-Hs)	m	29.0	41.0
Motor rated efficiency	%	85	85
Density	kg/m^3	1000	1000
Hydraulic power	kW	11.1	15.6
Pump shaft power	kW	34.2	36.9
Pump efficiency	%	**32**	**42**

Remarks:

- ✓ The chilled water pump B efficiency is calculated to be 32% and chilled water pump E efficiency is calculated to be 42%.
- ✓ It is recommended to do regular maintenance and operate the pump close to the best efficiency point to improve the efficiency of the pump.

8.9.4 Motor power measurement

The motor power measurement is carried out using the clamp meter and details are as follows.

S. No	Motor details	Rated capacity, kW	Motor Efficiency	Measured Voltage, V	Measured Current, A	Measured Power, kW	Power factor	Motor Loading, %
1	Cooling tower fan 2	11.19	85.0	415	2.50	1.71	0.95	12.97
2	Cooling tower fan 3	11.19	85.0	415	3.40	2.32	0.95	17.64
3	Cooling tower fan 4	11.19	85.0	415	4.88	3.33	0.95	25.31
4	Cooling tower fan 5	11.19	85.0	415	19.50	13.32	0.95	101.14
5	Condenser pump A	30	85.0	418	36.00	25.02	0.96	70.89
6	Condenser pump D	30	85.0	417	43.30	29.71	0.95	84.18
7	Chilled water pump B	37	85.0	414	59.00	40.19	0.95	92.33
8	Chilled water pump E	37	85.0	414	63.51	41.90	0.92	96.25

Remarks:

- ✓ The CT fan is provided with VFD for all CT fans except cooling tower fan 5. Motor loading is higher.

8.10 Air handling unit:

The Air handling unit performance has been carried out and details are as follows:

S. No	AHU ID	Rated CFM	Rated HP	Rated Power, kW	Measured Power, kW	Air Velocity, m/s	Filter Area, m²	Actual flow, CFM	Return Enthalpy, h(in) kJ/kg	Supply Enthalpy, h(out) kJ/kg	Actual TR
1	24 MTR_ AHU - 3, 4	44000	60.0	44.8	38.90	2.98	4.1	26181	51.20	39.44	50
2	Service Building_ 4th floor_ AHU A	9500	7.5	5.6	6.54	2.21	1.9	8769	54.08	42.96	16
3	Service Building_ 3rd floor_ AHU A	7000	5.0	3.7	4.85	2.05	1.6	6795	52.95	40.73	14
4	Service Building_ 2nd floor_ AHU A	7000	5.0	3.7	4.85	2.07	1.6	6858	48.91	42.98	7
5	Service Building_ Ground floor_ AHU A	7000	5.0	3.7	4.78	2.00	1.6	6621	52.63	44.99	8
6	UPS Room AHU B	23100	30.0	22.4	22.85	1.88	4.7	18494	49.81	37.76	37
7	UPS Room AHU A	23100	30.0	22.4	18.28	1.45	4.7	14257	49.81	45.40	10
8	ESP - 2_ AHU A	28000	20.0	14.9	19.05	2.21	5.9	27526	46.85	46.31	2
9	ESP - 2_ AHU C	28000	20.0	14.9	19.12	2.21	5.9	27540	47.54	46.93	3
10	ESP - 1_ AHU A	28000	20.0	14.9	12.72	0.98	5.9	12203	52.70	41.00	23
11	ESP - 1_ AHU B	28000	20.0	14.9	18.91	2.14	5.9	26676	53.22	43.64	42
12	ESP - 1_ AHU C	28000	20.0	14.9	18.56	2.11	5.9	26355	52.74	43.87	38

S. No	AHU ID	Actual kW/TR	Rated SEC (W/CFM)	Actual SEC (W/CFM)	CFM Loading	Deviation, %	Type of driven motor (Direct driven/Belt driven)
1	24 MTR_ AHU - 3, 4	0.77	1.20	1.49	60	24	Belt driven
2	Service Building_ 4th floor_ AHU A	0.41	0.69	0.75	92	8	Belt driven
3	Service Building_ 3rd floor_ AHU A	0.36	0.63	0.71	97	14	Belt driven
4	Service Building_ 2nd floor_ AHU A	0.73	0.63	0.71	98	13	Belt driven
5	Service Building_ Ground floor_ AHU A	0.58	0.63	0.72	95	15	Belt driven
6	UPS Room AHU B	0.63	1.14	1.24	80	8	Belt driven
7	UPS Room AHU A	1.77	1.14	1.28	62	12	Belt driven
8	ESP - 2_ AHU A	7.82	0.63	0.69	98	10	Belt driven
9	ESP - 2_ AHU C	6.94	0.63	0.69	98	11	Belt driven
10	ESP - 1_ AHU A	0.54	0.63	1.04	44	66	Belt driven
11	ESP - 1_ AHU B	0.45	0.63	0.71	95	13	Belt driven
12	ESP - 1_ AHU C	0.48	0.63	0.70	94	12	Belt driven

Remarks:

The AHU performance is observed to be satisfactory except ESP 1 AHU A. It is recommended to do regular maintenance and clean filter regularly to improve the performance of AHU.

9 Bench marking.

The following table gives the unit performance target for PAT-VII Cycle given by Bureau of Energy Efficiency.

Unit	Registration No.	Baseline Net Heat Rate, kCal/kWh	Baseline Export MU	Target Net Heat Rate, kCal/kWh
SINGARENI THERMAL POWER PLANT (2 X 600 MW)	TPP0217TS	2552.96	3303	2520.84

10 Energy conservation measures and recommendations

10.1 Arresting the APH air Leakage in boiler 1

Observation:

During MEA Test it is observed that the APH air leakage is higher than the design value by 1.15 % in Boiler -1

Recommendations:

It is recommended to attend the APH air leakage by attending the axial and radial seals during shut down. Also explore the possibility of reducing the PA quantity to APH. The following is the Energy saving calculation.

Estimated / Calculated Savings

Description	Unit	Boiler-1
Design air leakage	%	10.03
As run Air leakage	%	11.15
Excess air leakage qty	T/Hr	45
ID Fan SEC	kW/T	1.725
PA Fan SEC	kW/T	2.68
Expected Energy saving by limiting the air leakage in APH	kWh	198.225
Total Energy saving over a year (8000 Hrs)	kWh	1585800
Cost of energy saving per year@ Rs.5/per unit for 8000 Hrs	INR in lakhs	79.29
Investment	Rs in Lakhs	15
Simple Payback period	Days	68

10.2 Arresting the APH air Leakage in boiler 2

Observation:

During MEA Test it is observed that the APH air leakage is higher than the design value by 1.23% in Boiler -2.

Recommendations:

It is recommended to attend the APH air leakage by attending the axial and radial seals during shut down. Also explore the possibility of reducing the PA quantity to APH. The following is the Energy saving calculation.

Estimated / Calculated Savings

Description	Unit	Boiler-2
Design air leakage	%	10.03
As run Air leakage	%	11.26
Excess air leakage qty	T/Hr	50
ID Fan SEC	kW/T	2.05
PA Fan SEC	kW/T	2.65
Expected Energy saving by limiting the air leakage in APH	kWh	235
Total Energy saving over a year (8000 Hrs)	kWh	1880000
Cost of energy saving per year@ Rs.5/per unit for 8000 Hrs	INR in lakhs	94
Investment	Rs in Lakhs	15 Lakhs
Simple Payback period	Days	58

10.3 Optimize the AHP IAC compressor pressure setting.

Observation:

During audit it was observed that Instrument Air compressor 1A and 2A cut off pressure is set to 8 bar which is high. The compressed air from IAC is supplied to Ash silo which is around 2 km away from the Ash handling system which leads to pressure drop and receives the pressure around 5 bar at Silo end.

Recommendations:

It is recommended to reduce the cut in pressure to 5 bar and cut off pressure to 6 bar to achieve following energy savings.

Estimated / Calculated Savings

Description	Unit	IAC 1A	IAC 2A
Actual loading power consumption of compressor	kW	92.28	93.62
Average operating loading hours per annum	Hours/Annum	7,920	7,920
Present cut-off pressure set value	kg/cm2	7.5	8.0
Present cut-in pressure set value	kg/cm2	6.0	6.5
Proposed cut-off pressure value	kg/cm2	6.0	6.0
Proposed cut-in pressure value	kg/cm2	5.0	5.0
Unit cost	INR/kWh		
Expected savings with pressure optimization	%	12%	15%
Expected power savings	kW	10.90	13.93
Annual energy savings	kWh/Annum	86,317	1,10,316
Annual cost savings	INR/Annum	**0**	**0**
Investment	INR	Nil	Nil
Payback period	Months	Immediate	Immediate

10.4 Insulate/ reinsulate the steam line.

Observation:

During audit it was the steam line insulation survey was carried out and it was observed that steam line in few areas' insulation is damaged/naked which leads to heat loss.

Recommendations:

It is recommended to re insulate/insulate the naked steam line to reduce heat loss which reduces the fuel consumption in boiler.

Estimated / Calculated Savings

Heat loss due to uninsulated/ insulation damaged		
Description	**Unit**	**Values**
Surface area to be insulated	m^2	43.37
Total heat loss in existing System	kCal/hr	149361
Total heat loss after modified System	kCal/hr	4553
Reduction in heat loss	kCal/hr	144808
Annum operating hours	hours	7920
Annual total heat loss	kCal/Annum	1146879298
GCV of fuel	kCal/kg	4122
Average fuel savings	Tonne	278
Cost of fuel	INR/Tonne	7000
Annual cost savings	INR/Annum	**1947636**
Investment cost for Insulation	INR	303562
Payback Period	Month	2

11 Form 2

Form-2

Details of Energy Saving Measures recommended in the Energy Audit report (2023-2024)

Sl.no	Energy Saving Measures	Investment Millions INR	Reason for not implementing the measures	Date of Completion of measures/likely completion	Life cycle years	Annual Energy Savings				
						Oil	Gas	Coal, Tonnes	Electricity, Lakh kWh	Others
1	Arresting the APH air Leakage in boiler 1	1.5	-	-	-	0.0	0.0	0	15.9	0.0
2	Arresting the APH air Leakage in boiler 2	1.5	-	-	-	0.0	0.0	0	18.8	0.0
3	Optimize the AHP IAC compressor pressure setting.	Nil	-	-	-	0.0	0.0	0.0	1.97	0.0
4	Insulate/ reinsulate the steam line.	0.30	-	-	5	0.0	0.0	278.2	0.00	0.0

Signature:

Name of the Energy Manager: Mr. P. Veera Brahman

Name of the Company: SINGARENI THERMAL POWER PLANT (2 X 600 MW)

Full Address: PEGADAPALLY VILLAGE, JAIPUR, MANCHERIAL DIST,
TELANGANA STATE PIN – 504216
Contact Person: Mr. P. Veera Brahman
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Telephone/Fax numbers: 9445449277
Plant address: SINGARENI THERMAL POWER PLANT (2 X 600 MW),
MANCHERIAL DIST, TELANGANA STATE PIN – 504216

Signature:

Name of the AEA: B. SENTHILKUMAR

Accreditation details: NIN ENERGY INDIA PRIVATE LIMITED

Seal: