NEXT DATE: 03.12.2021

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL

PRINCIPAL BENCH, NEW DELHI

ORIGINAL APPLICATION NO.164/2018

IN THE MATTER OF:

ASHWANI KUMAR DUBEY ...APPLICANT

VERSUS

UNION OF INDIA & ORS ...RESPONDENTS

INDEX

SL.NO.	PARTICULAR	PAGE NO.
1.	RESPONSE OF THE VINDHYACHAL SUPER THERMAL POWER STATION LTD. [NTPC-VINDHYACHAL] TO THE QUARTERLY STATUS REPORT [COMPLIANCE STATUS] FILED BY THE OVERSIGHT COMMITTEE.	1-53
2.	Proof of Service	

Date: 22 / 11/**2021**

FILED BY:

C.C. No. 1893
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Supreme Court of India
New Delhi-110001

RESPONSE OF THE VINDHYACHAL SUPER THERMAL POWER STATION LTD. [NTPC – VINDHYACHAL] TO THE FIRST QUARTERLY REPORT OF THE OVERSIGHT COMMITTEE

S.NO.	OVERSIGHT COMMITTEE RECOMMENDATIONS IN ITS FIRST QUARTERLY REPORT(THERMAL POWER PLANTS)	RESPONSE OF THE VINDHYACHAL SUPER THERMAL POWER STATION LTD. [COMPLIANCE STATUS SUBMITTED AS ON 09.02.2021]
1.	The thermal power plants shall ensure that 100% fly ash utilization of the fly ash shall be ensured by them as per the Fly ash Notification.	Action plan for 100% ash utilization is attached as **Annexure-1.**
2.	For the achievement of new emission norms, equipments like FGD, SCR/ SNCR etc shall be got installed as per the time lines provided to them by the CPCB.	1. Contracts for the works have been awarded, as required. **2.** FGD installation work is in progress for all the units(1-12). The issue of timeline extension due to various unforeseen circumstances has been taken up with the CEA**(Annexure-2).** 3. De NOx limit has been achieved in unit 10 with combustion chamber modification. Action plan is in place to achieve the limit in all other units as per the CPCB time line of Dec'22.
3.	Fly ash dyke shall be monitored regularly for their strength through some reputed organizations. The design should be safe and timely maintenance should be regularly ensured.	Monitoring has been done through IIT-Roorkee in Nov'19. Design and construction of ash dykes of NTPC-Vindhyachal were certified as safe. Next round of third party monitoring will be done by IIT, Hyderabad for which contract has already been awarded. Visit of the term of the experts is expected in the month of Feb'21.
4.	Air borne fly ash from the ash dykes, specifically during summers should be controlled through arrangements of water sprinkling, vegetation and	Noted for compliance. Thin film of water is maintained above thetop surface of ash in the dykes that are inservice to prevent any fugitive dust emission. Sprinkling arrangement is also in

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	other scientific measure.	place. Fogging machine deployment will also be done with effect from Apr'21. Purchase Order for the machines has already been placed.
5.	NTPC- VSTPS shall ensure to start disposal of the fly ash in the abandoned Gorbi mines, and shall complete the related studies at the earliest.	EIA/EMP study interim report received from CMPDI on 23.01.21. MPPCB has been requested to give clearance to start ash filling based on the Radio Tracer, Flora-Fauna and EIA/EMP study reports vide letter dtd 23.01.21.
6.	Health check up of villagers through mobile medical van be conducted regularly for the detection of the occupational diseases like silicosis, fluorosis etc. and treatment be provided under CSR activities. Record should be maintained and made available to the district health authorities.	Noted for compliance. No cases of silicosis or other occupational diseases detected in the year 2020.
7.	The thermal power plants namely, M/s Essar Power MP Ltd. and M/s Sasan Power Ltd. shall deposit with MPPCB the remaining amount of environmental compensation of Rs. 9 Cr., and Rs. 8 Cr. respectively out of the levied amount of Rs. 10 Cr. M/s NTPC-Vindhyachal, has however obtained a stay from Hon'ble Supreme Court.	No response is required from the NTPC-Vindhyachal.
8.	NTPC- Vindhyachal shall complete the dredging of the Rihand reservoir for the removal of the ash flown into it due to breach of its ash dyke and to complete it within 3 months time.	Work is in progress. About 55,000 MT of sludge removal has been completed.
9.	NTPC- Vindhyachal should complete the studies of making RCC wall around the ash dyke through IIT Roorkee / IIT Delhi and submit the report for further consideration on its technical viability. Similarly studies / action should be initiated for the construction of Ash mounds.	• Contract for feasibility study for construction of RCC wall has been awarded to IIT-Roorkee. First visit of the team of experts is expected in the month of Mar'21. • Consultations for pilot project for construction of ash mound are in progress with IIT-Delhi. IIT-Roorkee was also contacted for the work but was informed that it lacks experience in the area. L&T-S&L was also approached by the NTPC-Vindhyachal but the agency has informed that the area of land proposed for

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		mound is very less.
10.	All the TPPs / industries shall calibrate all the CAAQMS and CEMS installed by them in 3 months (if not done recently) and submit the report to the committee. Such reports will be useful in checking the error percentage in the results.	Complied. Calibration report is attached as **Annexure-3.**

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RESPONSE OF THE VINDHYACHAL SUPER THERMAL POWER STATION LTD. [NTPC – VINDHYACHAL] TO THE SECOND QUARTERLY REPORT DATED 28.03.2021 OF THE OVERSIGHT COMMITTEE

S.NO.	OBSERVATIONSOF THE OVERSIGHT COMMITTEE IN QUARTERLY REPORT(THERMAL POWER PLANTS)	RESPONSE OF THE VINDHYACHAL SUPER THERMAL POWER STATION LTD.[COMPLIANCE STATUS SUBMITTED AS ON 04.05.2021]
1.	Presently 100 % Fly ash is not being utilized by the Thermal Power Plants situated in Singrauli Region except for the one TPP namely JP Nigrie Super Thermal Power Plant as this unit has one cement clinker grinding unit also where the fly ash is mostly utilized. However, action plans have been submitted by every TPP for 100% fly ash utilization but since 25% of the fly ash is not being used in the external overburdens by the coal mines of M/s NCL, the 100% utilization of fly ash by the thermal power plants is near to impossible. Intervention of Hon'ble NGT to direct M/s NCL specifically in this matter is required.	• Action plan to achieve 100% ash utilization by Mar'2024 is attached as **Annexure-4** along with the specific actions taken to enhance ash utilization. • Ash utilization for the year 2020-21 is 37.7 %. Annual ash utilization report is attached as **Annexure-5**. Efforts are being undertaken to achieve 100% ash utilization by the year 2024.
2.	The time for the installation of FGD for M/s namely JP Nigrie Super Thermal Power Plant has expired on 30-06-2020 and that for as well as Mahan Aluminum (Captive Power Plant) has expired on 30-06- 2018. Esaar Power MP Ltd. has gone into insolvency process and till that issue is settled, the installation of FGD etc remains to be stalled, for which the given time lines have expired on 31-12-2020. Similarly for other remaining thermal power plants, for whom the time for installation is still valid, like Sasan Power Ltd and NTPC are also delayed, the process of bidding /	• Contracts forthe works have been awarded, asrequired. • FGD installation work, to achieve flue gas SO2 limits, is in progress for all the units (1-12). Timeline prescribed as per the MoEF & CC notification dated 31-03-2021 [Environment (Protection) Amendment Rules, 2021] will be achieved. • Flue gas NOx limit has been achieved in unit 10 and unit 12 with combustion chamber modification. Action plan is in place to achieve the limit. Further, the work is in progress to achieve the same before the timeline prescribed as per the MoEF & CC notification dated 31-03-2021 [Environment (Protection) Amendment Rules,2021].

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	tenders/ orders etc is still going on and may not be completed within the given time lines by CPCB. However, the progress made by NTPC is somewhat ahead of other TPPs. On the other hand, matter seems to be in deliberation between MoP, MoEF & CC and also seems to be ceased up with Hon. Supreme Court. Also, CPCB has not initiated any coercive action against the three TPPs whose time lines have expired.	
3.	TPPs have got the testing of their ash dykes from institutions like IIT Roorkee, IIT BHU and private consultants. These institutes have found them to be safe. However, the departments like MoP or CEA etc. shall be entrusted with the responsibility of approving the designs initially and then regularly inspecting and approving the safety and stability from time to time. Also,during the height raising of the dykes, regular inspection should be carried out and SOPs for the same to be drawn and implemented in field. Presently no such checks by external expert regulatory body is being done by anybody.	• Dyke stability checking is proposed to be done on annual basis. • IIT–Roorkee had conducted dyke stability analysis of all 4 Shahpur dykes of NTPC-Vindhyachal in the year 2019. As per the report submitted, design and construction of the ash dykes was reported to be safe and no additional measures to enhance safety and stability of dyke were suggested. However, for V1 dyke, additional water escape structures in the form of spillways were suggested to take care of excessive rainfall conditions and the same have been incorporated in the design of the dyke and the construction has been completed. • IIT-Delhi had conducted the separate stability analysis for V2 dyke of NTPC-Vindhyachal in the year 2020, and suggested some berm stabilization through rock fill strengthening of starter dyke. Work is in progress to implement the same. • IIT-Hyderabad is at present conducting a comprehensive stability analysis of all ash dykes of NTPC-Vindhyachal, NTPC-Singrauli & NTPC-Rihand has already done its preliminary drone surveying.
4.	Compliance has been reported by the TPPs, that wetting of the top ash layer is done specifically in summer season.	• Thin water film is maintained on top of all ash dykes that are in service to prevent fugitive dust emission. • Purchase Order for procurement of 4 nos. of fog cannons for dust suppression is placed. Deployment is expected by 15.05.21.

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		• Continuous waters spray using swiveling valves and garden sprinklers is being done in V4A, V4B dykes. • Supplementary manual water spray through garland header is also being done.
5.	NTPC Vindhyachal has completed the studies and has submitted application before MPPCB for starting trial runs of the ash dumping in abandoned Gorbi Mines. MPPCB should take an early decision on the same.	Although no response is required from the NTPC-Vindhyachal. However, the steps taken by the NTPC-Vindhyachal are as under: • MPPCB clearance has been given for to start ash filling in mines subject to fulfillment of certain conditions. Work is in progress to ensure the compliance. The conditions include creation of a peripheral drain around the mine void and approach road development for which forest clearance is required. NCL has been requested to provide land details so that a formal application to DFO can be made. • NCL has to obtain DGMS clearance for start of work. Inputs from NTPC, as required for DGMS clearance, submitted. • Dist. Administration'spermission to allow road transport of ash is awaited. • Contract for ash transportation from VSTPS to GORBI mines is already in place. Unloading system installation works in progress to start the filling as soon as the clearance is granted. • Ash haul back study to establish permanent system is in progress. Draft report is expected by 31.05.21.
6.	Except for Sasan Power Ltd. other TPPs have accepted the recommendation that they will take up health check-up facilities for villagers through mobile medical van. However, no such cases of silicosis, fluorosis have been reported by the State Health Department.	In the prevailing COVID19 conditions, regular medical camps are not being held. Health check-ups, as per the recommendation, will be taken up if and when the situation permits.
7.	Sasan Power Ltd. has refused to deposit the amount on the pretext that Hon. NGT has ordered NTPC to	No response is required from the NTPC-Vindhyachal.

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	deposit the remaining amount and not to Sasan Power Ltd. Meanwhile NEERI has submitted its environmental damage compensation report in respect of M/s Essar Power MP Ltd. and a compensation of Rs 91.82 Cr. has been assessed. Since the TPP is now under NCLT, MPPCB has submitted its claim amounting to Rs. 90.82 (Rs 1 Cr already deposited), before the duly appointed dissolution professional. MPPCB has also filed court case under the provisions of the Water Act, 1974 and EP Act, 1986 for the non-compliances committed by M/s Sasan Power Ltd. which due to its illegal ash storage had taken lives of 6 citizens and caused pollution to the environment.	
8.	NTPC has reported that the work for removal of fly ash has been started and 55000 Tonnes of fly ash has been removed. However, no time targets have been given by them.	As per the CPCB-MPPCB Joint Committee report, the approximate quantity of ash breached out was estimated to be 2.25 Lac MT. This quantity of ash is already lifted from land (surface ash), from Rihand reservoir and its catchment area.
9.	NTPC has reported that Contract for feasibility study for construction of RCC wall awarded to IIT, Roorkee and their First visit is expected in Mar'21. They have also submitted that consultations for pilot project for construction of ash mound are progress with IIT-Delhi. IIT- Roorkee also contacted for the work but has informed that it lacks experience in the area. L&T-S&L was also approached but the agency has informed that the area of land proposed for mound is very less.	• IIT-Roorkee has been awarded with the contract to study the feasibility of RCC wall construction and to suggest its design. First site visit was done by the team of experts from IIT-Roorkee on 4th April, 2021. The draft report is awaited and being followed up. • IIT-Delhi has submitted a draft proposal for the construction of ash mound. The same is under technical review for implementation.

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10.	All the TPPs of the region except M/s Sasan Power Ltd, have submitted the calibration reports. Sasan Power Ltd has submitted that the calibration report will be submitted soon.	Calibration frequency is quarterly. Calibration reports have already been submitted.

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RESPONSE OF THE VINDHYACHAL SUPER THERMAL POWER STATION LTD. [NTPC – VINDHYACHAL] TO THE THIRD QUARTERLY REPORT DATED 15.06.2021 OF THE OVERSIGHT COMMITTEE

S.NO.	OBSERVATIONSOF THE OVERSIGHT COMMITTEE IN QUARTERLY REPORT(THERMAL POWER PLANTS)	RESPONSE OF THE VINDHYACHAL SUPER THERMAL POWER STATION LTD.[COMPLIANCE STATUS SUBMITTED AS ON 10.08.2021]
1.	Plans have been submitted by TPPs for 100% fly ash utilization but barring one TPP (JP Nigrie), others are unable to utilize 100% of fly ash. Hence compliance to be reported on additional steps / efforts undertaken by TPPs as well as the annual report for the FY 20-21 shall be submitted.	1. Summary status of additional measures being undertaken by the NTPC-Vindhyachal are attached as **Annexure-6**. 2. Annual report already submitted with the last compliance report.
2.	1. The efforts so far under taken by the TPPs are unsatisfactory. TPPs like JP Nigrie and Hindalco have already crossed the stipulated time lines and other TPPs also seem to be delaying the stipulated time lines. No one so far has been able to obtain revised timelines from CPCB/MoEF. Hence actions taken for compliance with the stipulated time lines need to be reported. 2. MoEF & CC vide its notification dated 31-03-2021 has introduced amendments in the timelines for compliance, TPPs are expected to report compliance in light of the new notification also.	1. Contracts for the works have been awarded as required. 2. FGD system installation work, to achieve flue gas SO2 limits, is in progress in all the units (1-12). Progress of work is as per **Annexure-7.** Timeline prescribed as per the MoEF & CC notification dated 31-03-2021 [Environment (Protection) Amendment Rules, 2021] will be achieved. 3. Flue gas NOx limit has been achieved for the unit 8, unit 10 and unit 12. Action plan is in place to achieve the limit in other units and the work is in progress to achieve the same before the timeline prescribed as per the MoEF & CC notification dated 31-03-2021 [Environment (Protection) Amendment Rules, 2021].
3.	TPPs have reported that the dyke strength testing has been carried out through outside testing agencies. But no SOPs have been provided as to the frequency of dyke strength checking, safety measures	1. In order to ensure dyke stability and safety, detailed technical audit by external expert is being carried out on annual basis. 2. IIT–Roorkee had conducted dyke stability analysis of all 4 Shahpur dykes of NTPC-Vindhyachal in the year 2019. As per the report submitted, design and construction of the dykes was reported to be safe and no additional measures

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	implementation, actions taken to implement the advice/recommendations of the testing agencies etc which shall be reported. Specifically for M/s Sasan TPP, its regular ash dyke is creating water logging situations in the fields, however no action has been proposed for the control of it.	to enhance safety and stability of dyke were suggested. However, for V1 dyke, additional water escape structures in the form of spillways were suggested to take care of excessive rainfall conditions and the same have been incorporated in the design of the dyke and the construction has been completed. 3. IIT-Delhi conducted a separate stability analysis of V2 dyke of NTPC-Vindhyachal in the year 2020 and suggested some berm stabilization through rock-fill strengthening of starter dyke. Work is in progress to implement the same. 4. IIT-Hyderabad has conducted a comprehensive stability analysis of all ash dykes of NTPC-Vindhyachal. The work included drone surveying. Detailed summary of the same are attached as **Annexure-8.** Report of the study is awaited. 5. Weekly inspection of all ash dykes is being carried out by inter-departmental team of NTPC Vindhyachal. Apart from this, daily monitoring in night is also being done during the Monsoon period. These inspections are over and above the 24 hour patrolling being done in dyke area through contractual manpower to monitor any abnormality. It is submitted that any observations during these inspections are immediately attended. 6. Robotic inspection of water escape structure and decanting pipelines for V-2 ash dyke has been carried out by one M/s Digital Surveillance Inc. The wells were inspected internally by deploying a specially designed truss frame carrying a pan tilt zoom camera, with an objective to visually examine the condition of the well. The pipelines were inspected internally by deploying a robot equipped with video camera for visual inspection and sonar profiler for mapping ash accumulation. No major defect was observed in the inspection.

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4.	Verifiable/Quantifiable measures undertaken to control the air borne fly ash for the ash ponds in the ensuing summer season shall be reported along with photographs.	1. 04 Nos. of fog canons have been procured and are under commissioning. 2. 15 Eagle Sprinklers and 50 garden sprinklers in a HDPE pipe network of 500 Meters have been installed in Baliyari dyke. 3. 40 more automatic swiveling sprinklers have already been procured and procurement of another 200 is under progress. Installation is expected to be completed by 2021-2022. 4. Procurement of additional 20 Km HDPE pipes and garden sprinkling system for fugitive dust suppression is in progress. Installation is expected to be completed by 2021-2022. 5. Manual sprinkling through flexible hose pipes is being done in all the dykes. 6. Thin water film is maintained on top of all ash dykes that are in service to prevent fugitive dust emission.
5.	Ash haul back study shall be completed at the earliest and permanentproposal for the conveyance of the fly ash from TPP site to Gorbi mines should be finalized at the earliest.	1. Ash filling in GORBI mines has started. 2. Ash haul back study has been completed. Concept report has been submitted by the consultant. Final decision, for mode to be selected, is under discussion.
6.	TPPS may conduct other routine check ups like eye camps etc as ususal but health check up of villagers through mobile medical van fort he detection of the occupational diseases like silicosis, fluorosis etc, shall be specifically conducted and reported to the district health authorities. TPPs like Sasan Power have reported in a cursoryway.	In the prevailing COVID-19 conditions, regular medical camps are not being held. Health check-ups, as per the recommendation, will be taken up if and when the situation permits.
7.	Recommendations stand good for Sasan Power Ltd as well as Essar Power Ltd, however NEERI has already submitted its report in its case amounting to a compensation of Rs. 91.82 Cr., which needs to be deposited. Similarly Sasan Power should deposit Rs 8.0 Cr as interim environmental compensation	No response is required from the NTPC-Vindhyachal.
8.	NTPC- Vindhyachal has reported that spilled out ash has been lifted from land and from Rihand Reservoir. However it has not been clarified that	About 1 lac MT of ash/sludge has been lifted through dredging from the Reservoir and its catchment area. Since as per the CPCB-MPPCB Joint Committee

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	how much ash has been removed from the Rihand reservoir, and whether there is any more fly ash still remains in the reservoir	report, the approximate quantity of ash breached out was estimated to be 2.25 Lac MT and this quantity of ash is already lifted from land (surface ash), from Rihand reservoir and its catchment area, it is estimated that all the fly ash spilled out in the reservoir and its catchment area due to V1 dyke breach has been lifted.
9.	NTPC-Vindhyachal has also reported that they have given work order to IIT-Roorkee to study the construction of RCC wall around the ash dyke.	1. Feasibility study by IIT-Roorkee regarding RCC wall construction around Ash dyke area has been completed. As per the report, *"the construction of RCC wall around the ash dykes is neither feasible from technical point of view nor required as the existing dykes are found to be structurally safe having adequate margin of factor of safety as per codal provisions of IS codes."*Report of the feasibility study is attached as **Annexure-9**. 2. Regarding ash mound construction, technical consultancy for the works involved is not readily available. But after lot of follow-up, a preliminary scope of consultancy work has been received from IIT-Delhi and a proposal for construction of ash mound above one of the abandoned ash dykes as a pilot project is currently under discussion/consideration. Meanwhile, IIT-Hyderabad has conducted Seismic analysis of the site proposed for Ash mound development. The results are awaited.
10.	Reports as to calibration frequency and results to be reported by all, specifically by Sasan Power Ltd.	The reports have already been submitted to the Oversight Committee.

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S.R. 464/21 13
Date 23/8/21 Place ...

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI
ORIGINAL APPLICATION NO. 164/2018

IN THE MATTER OF:

ASHWANI KUMAR DUBEY ...APPLICANT

VERSUS

UNION OF INDIA & ORS. ...RESPONDENTS

AFFIDAVIT

I, Munish Kumar Jain, S/o Late Madan Gopal Jain aged about 48 years, working as Additional General Manager(Environment Management), presently at NTPC Ltd-Vindhyachal Super Thermal Power Station, Singrauli, M.P., do hereby solemnly affirm and state as under:

1. That I am the Authorised Signatory of the Respondent No. 10 herein in the abovementioned matter and as such I am well conversant with the facts and circumstances of the case and hence, I am authorised to swear to this affidavit.
2. That I have read and understood the contents of the accompanying response, which has been drafted under my instructions and the same are true and correct to my knowledge and belief.
3. That the Annexure 1 – 9 enclosed with the accompanying responseis/are true copy of its/their original.

DEPONENT

DEPONENT
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NTPC Limited-Vindhyachal

VERIFICATION

Verified at Singrauli, M.P., on this 23rd day of August, 2021. That the contents of my above affidavit from paras 1 to 3 are true and correct to my knowledge and belief, no part of it is false and nothing material has been concealed therefrom.

Munish Kumar Jain S/o Late Madan Gopal Jain
NTPC Vindhyachal ... identified by A.K. Jaiswal ... Solemnly affirmed at ... 23 ... Aug. 21 ...

A Jaiswal
...tified by

BABU RAM JAISWAL
Oath Commissioner

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Annexure 1

100% ASH UTILIZATION PLAN

UOM: LMT

	2020-21	2021-22	2022-23	2023-24
Expected Ash Gen	80	80	80	80
Transportation cost sharing Incentive Scheme for Cement Plants	4	6	6	4
Supply to Cement Plants through rail transportation	1	3	10	13
Utilisation in OB mixing	0	4	13	32
Mines Filling	0	4	5	7
Waste land development	8.5	10	15	8
Brick Manu. & other Fly ash based industry	1	2.5	3	3
Road Construction	6.5	10	15	10
Ash Dyke Raising	11	8	2	0
Ash Park (Rewa)	0.2	0.2	0.5	1
Ash Mound		0.3	1.5	2
Total AU	32.2	48	71	80
AU%	**40%**	**60%**	**90%**	**100%**

EXTERNAL SUPPORT REQUIRED

- Implementation of Demand side provisions of MoEF notification on fly ash utilization including mandatory use of fly ash bricks and OB mixing with fly ash.
- Creation of requisite rail/road infrastructure to support ash evacuation from the region to ensure 100 % ash utilization.
- Clearance for ash filling in GORBI mines.
- Early clearance of Waste Land Development proposals.

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15

Initiatives & Measures taken by NTPC Vindhyachal to improve ash utilization

1. Efforts are being made to start GORBI mine filling within a short period of time. Since the mine void is filled with water of very low pH, all care has to be taken to ensure that no environmental hazard is created and clearances from regulatory/statutory authorities are obtained before start of work. MPPCB has given elaborate and detailed terms and conditions for allowing permission for ash filling. Based on the interim Environment Study reports, NTPC Vindhyachal has approach MPPCB again on 23.01.21 for interim clearance. MoEF has already clarified that no separate clearance from them is required as long as the CPCB guidelines on mine filling are followed and the same will be complied with. Work is also in progress to comply with DGMS requirements.
2. Supply of fly ash to Cement Manufacturers started in July'20 under Incentive scheme for making it financially viable for them to lift ash from VSTPS.
3. VSTPS is regularly taking up the work of Waste Land Development of Govt/Publiv/Private land using fly ash at various locations within 100 kms of Plant radius. Total ash utilisation in these contracts is expected to be around 8.5 LMT in the financial year 2020-21. Contract for the works have already been awarded.
4. VSTPS has been continuously following up with NHAI for getting requirement for ash in road construction. A requirement of about 10 lac MT has now been received from NHAI, Varanasi and supply of ash has been started in Aug'20. VSTPS is committed to provide ash to all projects under Pradhan Mantri Gramin Sadak Yojna and asset creation programmes of the Government involving construction of buildings, road, dams and embankments within 300 kms of the Plant as and when the requirement is received.
5. Fly ash transportation by rail to Satna/Rewa region and other places for reducing transportation cost is planned. NTPC is procuring 3 rakes of BTAP wagons for the purpose at a cost of ~ 60 crores. Rail loading facility is expected to become functional by Mar'21. However, in the meantime, rail transport of fly ash filled in bags is being done on trial basis.
6. Ash park has been set up at Rewa where fly ash transported in 50 kg bags from VSTPS is made available to the ash based industries in the region. Vindhyachal has been the first Plant in the region to start such an initiative. Ash bagging machines have been installed for the purpose in the SILOs at Vindhyachal. Bagging machines for Jumbo bag filling (1-1.5 T) are also planned to be installed.
7. VSTPS has started supplying fly ash to the ash based industries within 100 kms from the Plant. Free of cost Door step delivery is being made. Again, Vindhyachal is the first Plant in the region to start such an initiative
8. Contract for door step delivery of fly ash to ash based industries up to 300 kms distance from the Plant has been awarded.
9. VSTPS is actively following up with Distt Administration for awarding any abandoned quarries which can be developed using ash. One no. of stone quarry was awarded to VSTPS in Makrohar region where ash filling has been completed.
10. VSTPS has approached IIT-Roorkee, IIT-Delhi and other vendors for construction of Ash Mound as a pilot project.
11. VSTPS is making around 75,000 ash bricks/day for its own use. No red brick is used for any construction activity within Plant or township.
12. Consistent efforts are being made by VSTPS requesting NCL for mixing of fly ash with OB but so far the efforts have not yielded fruit.

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16

Annexure-2

No. 10/1/2020-S. Th.
Government of India
Ministry of Power

Shram Shakti Bhawan, Rafi Marg,
New Delhi, dated 19.10.2020

OFFICE MEMORANDUM

Sub: Meeting chaired by Secretary (Power) on 13.10.2020 at 3:30 PM with States, Central Generating Companies and IPPs to review the status/ timelines of implementation of emission control equipments in Thermal Power Plants - reg.

The undersigned is directed to inform that Secretary (Power) chaired a meeting through Video Conferencing, on 13.10.2020 at 3:30 PM with States, Central Generating Companies and IPPs to review the status of implementation of emission control equipments in Thermal Power Plants.

2. In this regard, minutes of the meeting is enclosed for information and necessary action.

Enclosed: as stated.

Nishat Kumar
Under Secretary to the Govt.of India
Tel: 23715507, Ext: 212

To,

i. All Energy Secretaries of States having coal based Thermal Power Plants.
ii. Chairperson, CEA
iii. CMD, NTPC
iv. CMD, DVC
v. CMD, NLC
vi. All IPPs

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एनटीपीसी लिमिटेड-विंध्याचल
NTPC Limited-Vindhyachal

17

Minutes of the Meeting chaired by Secretary (Power) with States, Central Generating Companies and IPPs on 13.10.2020 at 3.30 PM to review the status/ timelines for installation of emission control equipment by Thermal Power Plants

List of participants is annexed.

2. At the outset, Secretary (Power) welcomed all the participants. After a brief round of introduction of participants, JS(Thermal) informed that in the meeting chaired by Secretary, Ministry of Environment Forest & Climate Change (MoEF&CC) on 15.09.2020, it was deliberated that CPCB would make a combined assessment exercise, in consultation with MoP and CEA and reconcile the progress status of each unit against the committed timelines and also estimate timelines for compliance based on progress made by individual units. Based on the above assessment, CPCB may consider a reasonable relaxation in timelines due to COVID-19 Impact on case to case basis. Further, in a meeting chaired by Hon'ble Minister (Power) on 07.10.2020 it was directed to review the sincerity of action taken by utilities so far and assess final timelines by which they would comply with Central Pollution Control Board (CPCB)'s stipulations in respect of emission norms. In case Gencos fail to explain the reasons for any delay on their part, they may have to face penalty/ Environmental Compensation (EC) by CPCB for non-bona fide delays.

3. CE (TPRM), CEA made a State-wise, sector-wise power presentation on the progress of FGD installation by individual units. The progress of each unit along with reasons for the delay so far was deliberated with the concerned developers. Gist of the various issues discussed/ raised by developers were as follows:

3.1 **Stressed Thermal Power Plants**: As regards 34 stressed thermal power assets/units identified by Department of Financial Services (DFS), it was informed that MoP had already proposed extension for such units on the ground that timelines need to be worked out from the date new owner/ management takes over the stressed asset either through National Company Law Tribunal (NCLT) or through One Time Settlement (OTS) mechanism. The developers who had taken over the stressed assets would submit complete details and documents to CEA for enabling the assessment which could be submitted for consideration of MoEF&CC.

3.2 **Cost recovery of FGD installations for projects without PPA**: It was informed that a mechanism in this regard had been proposed by Confederation of Indian Industry (CII) and Association of Power Producers (APP). The matter would be examined in consultation with CEA.

3.3 **Staff paper of Central Electricity Regulatory Commission (CERC) for cost compensation:** It was informed that CERC has hosted a staff paper on its website seeking comments of stakeholders on the proposed mechanism for compensation for competitively bid out Thermal Generating Stations for Change in Law on account of compliance of the revised emission standards notified by MoEF&CC. All the concerned utilities were requested to send their

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comments to CERC so that the matter might be considered by CERC appropriately.

3.3.1 As regards pending cases of some IPP's with SERCs, it was observed that APTEL had already given its Order for considering MoEF&CC's New Emisson Norms as 'Change in Law' event in the specific case of Punjab SERC. The same has already been informed to all Gencos by CEA and to all SERCs by Forum of Regulators (FOR)/CERC, as per MoP's directions.

3.4 **Amendment in NOx emission norms** : It was informed that based on Hon'ble Supreme Court's observation with respect to NOx emission norms for thermal plants commissioned between 01.01.2004 and 31.12.2016, the issue had been taken up with MoEF&CC for issuing necessary amendment in NOx emission norms upto 450 mg/Nm3.

3.5 **Ultra norms by RKM Powergen for expediting installation of FGD** : RKM Powergen was requested to share the technology on Ultra norms on emission being adopted by them in their Uchpinda TPP as they had claimed to reduce the implementation time for FGD installation to 15-20 months. CEA was advised to study the feasibility of the technology adopted by RKM Powergen in other similarly placed plants.

3.6 **Assessment on progress made by each thermal power units for compliance of emission norms**: Each unit and developer was asked to explain the reason for delay in completing feasibility study/ making tender specification/ issuing NIT/ non-finalisation of bids/ award of bids so far. They were also asked to submit a definitive timelines for each of the pending activity while indicating timelines for meeting each of the milestone for compliance of emission norms. It was observed that some of data provided by developers to CEA in this regard were outdated/ faulty and required suitable updation. All the Gencos were requested to submit to CEA by 21.10.2010, the reasons (with documentary proof) for delays so far in respect of failure in compliance of emission norms as per the phasing plan and also submit a definitive action plan for meeting emission norms with timelines for each of milestones separately.

4. **Draft notification on utilization of fly ash**: It was observed that some of the States had made representations to Ministry of Power (MoP) for doing away the requirement of meeting transportation cost of fly ash by Thermal power plants. It was informed that MoEF&CC had proposed a draft notification on fly ash utilization seeking comments of MoP before hosting in public domain seeking comments of various stakeholders.

4.1 It was noted that the draft notification had put stringent conditions on utilization of fly ash and provision of penalty varying from Rs.1500/ tonne to Rs.2,000/tonne for not meeting the proposed fly ash utilization norms. All the Gencos were requested to submit their comments to CEA by 21.10.2020 and CEA was advised to compile comments of Gencos and submit an analysis to Ministry of Power by 23.10.2020 for taking up the matter with MoEF&CC appropriately.

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5. **Recommendations**: After detailed discussion and deliberations, the following were recommended:

5.1 **FGD Installations**: All developers/ Gencos to submit details unit wise to CEA by 21.10.2020 at cetprmcea@nic.in as follows:

1. Prescribed CPCB timelines for FGD installation.
2. Action Taken from thereon and Reasons for Delay till date for each of the milestone.
3. Date of completion of Feasibility study- if not, likely completion date.
4. Date for finalization of tender specifications- if not, likely completion date.
5. Date of issue of NIT- if not, likely completion date of issue of NIT
6. Date of bid opening- if not, likely bid opening date.
7. Date of award of bids/ placing purchase orders- if not, likely completion date.
8. Date of Final Commitment for FGD commissioning.

5.1.1 CEA will compile the details on the above commitments from all the 448 thermal power plant units and other left out under construction units having Environment Clearance (EC) prior to 07.12.2015. Based on the inputs so received, CEA will make its own assessment regarding proposed final timelines for FGD installations, based on available records and track record of the utility so far in compliance of emission norms. A detailed assessment and analysis unit wise shall be submitted by CEA to MoP by 23.10.2020

5.1.2 Timelines for the identified 34 stressed assets may be re-worked from the date of taking over by new management/company/project out of stress.

5.2 **Draft notification on fly ash utilization**: All the Gencos (Central/ State Gencos and IPPs) to send comments on the draft MoEF&CC Notification on utilization of fly ash by Thermal Power Plants by 21.10.2020 to CEA at cetprm-cea@nic.in and tcdcea@gov.in.

5.2.1 MoP will re-send the emails to those Gencos who had not received emails pertaining to the proposed draft Notification of MoEF&CC.

5.2.2 CEA to compile the comments received on draft MoEF&CC Notification on Utilization of fly ash by Thermal Power Plants and submit a detailed analysis of comments received to the MoP by 23.10.2020.

6. The meeting ended with a vote of thanks to the chair.

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NTPC Limited-Vindhyachal

List of Participants

Ministry of Power

1. Shri S.N. Sahai, Secretary (Power) ..... in chair
2. Shri S.K.G. Rahate, Additional Secretary (Power)
3. Shri V.K. Dewangan, Joint Secretary (Th.)
4. Shri Rakesh Kumar, OSD to Secretary (Power)
5. Shri Nishat Kumar Under Secretary (S.Th.)
6. Shri Bhanu Joshi, Section Officer (S.Th.)

Central Electricity Authority

7. Shri B.C. Mallick, CE
8. Sh. Rajeev Kumar, Director
9. Sh. Baleshwar Thakur, Director
10. Shri Surendra Kumar, Deputy Director (TPRM)
11. Shri Saurabh Parth Sarthi, AD (TPRM)
12. Sh. Bitan Ray, Deputy Director

NTPC

13. Sh. Gurdeep Singh, CMD
14. Shri U.K Bhattacharya, ED
15. Shri Ramesh Babu, Director (Operations)
16. Shri SM Choudhary, ED
17. Shri B B Chugh, GM
18. Shri Udayan Kumar, GM
19. Shri Pankaj Gupta, AGM

DVC

20. Shri A.K Verma, ED (Projects)
21. Shri M C Mishra, ED (Operations)
22. Shri B Dutta, ED (Engg.)

NLC India Ltd.

23. Shri Shaji John (Dir)
24. Shri Balasubramanian (GM)

Singareni Collieries Limited (SCCL)

25. Shri S.K. Sur, CTC
26. Shri J.N. Singh, Chief OLM
27. Shri Ch. Vasudevamurthy

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Andhra Pradesh

28. Shri N. Srikanta, Principal Secy. (Energy)

Assam

29. Shri Niraj Verma, Secretary, Power
30. Shri Kalyani Baruah, MD, APGCL

Bihar

31. Shri A.K. Sinha Director (Technical)
32. Shri Sakshi, OSD (Technical)
33. Shri Shweta Priya, Assistant Engineer

Chhattisgarh

34. Shri Subrat Sahoo, Additional Chief Secretary

Gujarat

35. Shri Sunaina Tomar, ACS, Energy and Petrochemicals, Gujarat
36. Shri H.N. Baxi, MD, GSECL

Haryana

37. Mohd Shayin, MD, HPGCL

Jharkhand

38. Sri Basarat Kyum, MD , Jharkhand Urja Utpadan Nigam Ltd
39. Sri Arvind Kumar Sinha, MD, TVNL

Karnataka

40. Shri Ponnuraju V., MD, KPCL

Madhya Pradesh

41. Shri Sanjay Dubey, Principal Secy. (Energy)

Maharashtra

42. Shri V. Thangapandian, Director (Projects), MAHAGENCO

Odisha

43. Shri Indranil Dutta, MD, OPGC
44. Shri Sanjeev Kishore, Regional Executive Director, NTPC

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Punjab

45. Shri A. Venugopal, CMD, PSPCL
46. Shri Narender Mehta, OSD to ACS

Rajasthan

47. Shri A.K. Gupta, MD, JVVNL

Tamil Nadu

48. Shri Pankaj Kumar Bansal, CMD, TANGEDCO
49. Shri R. Ethiraj, Director, Generation, TANGEDCO
50. Shri M. Chitra, Chief Engineer, TANGEDCO

Telangana

51. Shri D. Prabhakar Rao, CMD TS GENCO
52. Shri Lakshmaiah, Director Thermal, TS GENCO
53. Shri Satchidanandan, Director Project, TS GENCO
54. Shri Ajay Kumar, Director, Civil, SCCL Ltd
55. Shri D. Satyanarayana Rao, Director (E&M) SCCL
56. Shri Muralidharan, Chief Coordinator, SCCL

Uttar Pradesh

57. Shri Senthil Pandian C. MD, UPRVUNL
58. Shri Ajit Kumar Tiwary, Director (Technical), UPRVUNL

West Bengal

59. Shri S. Suresh Kumar, ACS, Power

JSPL

60. Shri KK Agarwal, MD
61. Shri Siddharth Mohanty, VP
62. Shri Amit Kumar, TA to Chairman

Lanco Apara Power Ltd.

63. Shri Vamsi Krishna Bopanna, GM
64. Shri M Narsimha Murthy, VP

Essar Power

65. Shri Kush
66. Shri Rajamohan

Ideal Energy Projects Ltd.

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67. Shri KK Fadnavis
68. Shri Vivek N. Masade

MB Power

69. Shri Ravi Arya
70. Shri Dinesh Batra
71. Shri Vinod Agarwal

GMR Energy

72. Shri Ashis Basu
73. Shri Balaji Sivan

Sembcorp Energy

74. Shri Raghav Trivedi
75. Shri Mahesh Virpadas

Lanco Amarkantak Power Ltd.

76. Shri Anil Sharma, VP
77. Shri Vamsi Krishna

Reliance Power Ltd.

78. Shri Manoj B. Pongde, VP
79. Shri Kiran Narasinga

HNPCL

80. Shri R.C. Padhy

Tata Power

81. Mr Vijay Namjoshi, Chief - Generation, Tata Power
82. Mr Ramkrishna Gadre, Chief- Engineering & Quality, Tata Power
83. Mr Ivaturi Rao, Head - Corporate Environment, Tata Power
84. Mr Rahman Sidiqur,Head Projects
85. Ms Paramita Sahoo, Head Advocacy
86. Ms Nandita Singh, Advocacy
87. Mr Mukul Singh, Group Head Environment.

DB Power

88. Sh. Suresh Nagarajan, CEO
89. Shri Manu Krishnan Namboothiri, Head(Strategy, Power sales & Corporate Relationships)

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Torrent Power

90. Shri Virtal Mehta , VP (Generation)
91. Shri J B Patel , GM (Maintenance)
92. Shri Nirav Mehta, Mgr (Project)

KSK Mahanadi

93. Dr.M.V.R.N Acharyulu, Senior Deputy General Manager (Environment)

L&T

94. Shri Afroz Ali, General Manager
95. Shri Saurabh Patel, Manager

Bajaj/Lalitpur Power Generation

96. Sh. Tara Chandra Upreti
97. Shri Ankush J, AVP

Adani Power

98. Shri MR Krishna Rao,
99. Sh. MS KS Nagendra

RKM Powergen

100. Sh. T M Singaravel, Director (Operations)

CESC Limited/Haldi Energy

101. Sh. Sudipto Mukherjee, ED

Dhariwal Infrastructure Ltd.

102. Sh. Bhaskar Kr Ganguly, GM
103. Sh. Kush Kumar, Head – Corporate Affairs

JIPTL

104. Sh. Punit Gupta

SKS Binjkote

105. Sh. Rama Krishna

Rattan India

106. Sh. Gautam Wazir

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Sterlite Energy

107. Sh. Aditya Pyasi

TAQA Neyveli

108. Sh. Raghunathan K.

Lanco Anpara

109. Sh. M. Narasimha Murthy

KSK Mahanadi

110. Dr.M.V.R.N Acharyulu, Senior Deputy General Manager(Environment),

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Annexure-3

VSTPS STAGE 1 CEMS PARAMETER CALIBRATION REPORT

S.N	UNIT 1				DATE: 28/01/21	
	Gas Cal.	Nox(0-1500ppm)	Sox(0-1500ppm)	CO2(0-20%)	CO(0-1000ppm)	Rmarks
A	Zero Gas Conc.	0	0	0	0	
1	Zero Gas before Cal.	2	3	1	0	
2	Zero Gas after Cal.	0	0	0	0	
B	Span Gas Conc.	1275	1275	17.20	859	
3	Span Gas before Cal.	1270	1275	17.17	856	
4	Span Gas after Cal.	1275	1275	17.20	859	

S.N	UNIT 2				DATE: 28/01/21	
	Gas Cal.	Nox(0-1500ppm)	Sox(0-1500ppm)	CO2(0-20%)	CO(0-1000ppm)	Rmarks
A	Zero Gas Conc.	0	0	0	0	
1	Zero Gas before Cal.	1	4	0	1	
2	Zero Gas after Cal.	0	0	0	0	
B	Span Gas Conc.	1275	1275	17.20	859	
3	Span Gas before Cal.	1270	1274	17.18	859	
4	Span Gas after Cal.	1275	1275	17.20	859	

S.N	UNIT 3				DATE: 28/01/21	
	Gas Cal.	Nox(0-1500ppm)	Sox(0-1500ppm)	CO2(0-20%)	CO(0-1000ppm)	Rmarks
A	Zero Gas Conc.	0	0	0	0	
1	Zero Gas before Cal.	3	1	0	2	
2	Zero Gas after Cal.	0	0	0	0	
B	Span Gas Conc.	1275	1275	17.20	859	
3	Span Gas before Cal.	1278	1269	16.9	854	
4	Span Gas after Cal.	1274	1275	16.95	859	

S.N	UNIT 4				DATE: 28/01/21	
	Gas Cal.	Nox(0-1500ppm)	Sox(0-1500ppm)	CO2(0-20%)	CO(0-1000ppm)	Rmarks
A	Zero Gas Conc.	0	0	0	0	
1	Zero Gas before Cal.	2	2	0	1	
2	Zero Gas after Cal.	0	0	0	0	
B	Span Gas Conc.	1275	1275	17.20	859	
3	Span Gas before Cal.	1271	1275	17.17	858	
4	Span Gas after Cal.	1275	1275	17.20	859	

S.N	UNIT 5				DATE: 28/01/21	
	Gas Cal.	Nox(0-1500ppm)	Sox(0-1500ppm)	CO2(0-20%)	CO(0-1000ppm)	Rmarks
A	Zero Gas Conc.	0	0	0	0	
1	Zero Gas before Cal.	0	2	0	1	
2	Zero Gas after Cal.	0	0	0	0	
B	Span Gas Conc.	1275	1275	17.20	859	
3	Span Gas before Cal.	1275	1273	17.18	852	
4	Span Gas after Cal.	1275	1275	17.20	854	

S.N	UNIT 6				DATE: 28/01/21	
	Gas Cal.	Nox(0-1500ppm)	Sox(0-1500ppm)	CO2(0-20%)	CO(0-1000ppm)	Rmarks
A	Zero Gas Conc.	0	0	0	0	
1	Zero Gas before Cal.	4	1	0	1	
2	Zero Gas after Cal.	0	0	0	0	
B	Span Gas Conc.	1275	1275	17.20	859	
3	Span Gas before Cal.	1270	1273	17.19	853	
4	Span Gas after Cal.	1275	1275	17.20	859	

Calibrated by: Anylizer Instrument Ltd.

Checked by: 28.01.21

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RECORD FOR MONTHLY PREVENTIVE MAINTENANCE

ANALYSER INSTRUMENT CO. PVT LTD.

E-29 (A), ROAD NO.2, I.P. INDUSTRIAL AREA,
KOTA-324005, RAJASTHAN
PH: 0744-2420610, 2420611, 2430611
E-MAIL: aicplindia@gmail.com Website: www.aicplindia.com

29.12.2020 to 28.01.2021 Period

Customer Details: **NTPC** Vindhyachal I

Maintenance Visit Date: 26/01/21

SR. NO.	REPORT DATED	SITES (UNIT)	PREVENTIVE MAINTENANCE DONE AS PER CHECK LIST ENLCOSED AND ANALYSER SYSTEM CHECKED	SYSTEM STATUS	REMARKS
01	25/01/21	Unit #1	checked	ok	
02	25/01/21	Unit #2	checked	ok	
03	26/01/21	Unit #3	checked	ok	
04	26/01/21	Unit #4	Checked	ok	
05	26/01/21	Unit #5	Checked		
06	26/01				

DETAILS OF ANY SPECAL WORK DONE:
(1) UH1 to UH6 CEMS Complete Preventive maintenece done
(2) UH1 to UH6 FT & FGT Checked Runing ok
(3) UH1 to UH6 Zero and spand calbreation done
(4) All Systems healthy and Runing ok

REMARKS:
(1) New Replec im Semic filter UH 1
(2) UH 1 New Replec im Sonlight No.

AIC ENGINEER

NTPC REPRESENTATIVE

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28

CEMS CALIBRATION REPORT

UNIT 7

DATE 20/10/2020

Sr no	Gas Cal	NOx 0-1500 PPM	SO2 0-1500 PPM	CO2 0-40%	CO 0-2000 PPM	REMARKS
1	Zero Gas Before cal	2	1	0		
2	Zero Gas After cal	0	0	0		
3	Span Gas Before cal	1266	1347	17.32%		
4	Span Gas After cal	1266	1349	17.32%		
5	Sample Reading before	224	338	11.03%		
6	Sample Reading After	226	340	11.05%		

Nox Gas Cylinder 1266 ppm

SOx Gas Cylinder 1349 ppm

CO Gas Cylinder _____

CO2 Gas Cylinder 17.32%

CEMS CALIBRATION REPORT

UNIT 8

DATE: 20/10/2020

Sr no	Gas Cal	NOx 0-1500 PPM	SO2 0-1500 PPM	CO2 0-40%	CO 0-2000 PPM	REMARKS
1	Zero Gas Before cal	1	1	0		
2	Zero Gas After cal	~~1266~~ 0	0	0		
3	Span Gas Before cal	1266	1347	17.30%		
4	Span Gas After cal	1266	1349	17.32%		
5	Sample Reading before	233	279	11.28%		
6	Sample Reading After	235	280	11.30%		

Nox Gas Cylinder 1266 ppm

SOx Gas Cylinder 1349 ppm

CO Gas Cylinder _____

CO2 Gas Cylinder 17.32%

Sign: NTPC

31/10/20
(Jiwesh)

मुनीष जैन
Munish Jain
अपर महाप्रबंधक (ईएमजी/एयुडी)
AGM (EMG/AUD)
एनटीपीसी लिमिटेड-विंध्याचल
NTPC Limited-Vindhyachal

CEMS CALIBRATION REPORT

UNIT 8

DATE 25/11/20

Sr no	Gas Cal	NOx 0-1500 PPM	SO2 0-1500 PPM	CO2 0-20%	CO 0-500 PPM	REMARKS
1	Zero Gas Before cal	1	2	0		
2	Zero Gas After cal	0	0	0		
3	Span Gas Before cal	1275	1275	17.32%		
4	Span Gas After cal	1274	1275	17.31%		
5	Sample Reading before	261	266	10.98%		
6	Sample Reading After	262	267	10.99%		

NOx Gas Cylinder 1275 PPm

SOx Gas Cylinder 1275 PPm

CO Gas Cylinder _____

CO2 Gas Cylinder 17.32%

CEMS CALIBRATION REPORT

UNIT 7

DATE 25/11/20

Sr no	Gas Cal	NOx 0-1500 PPM	SO2 0-1500 PPM	CO2 0-20%	CO 0-500 PPM	REMARKS
1	Zero Gas Before cal	1	2	0		
2	Zero Gas After cal	0	0	0		
3	Span Gas Before cal	1275	1275	17.32%		
4	Span Gas After cal	1275	1273	17.32%		
5	Sample Reading before	336	367	12.33		
6	Sample Reading After	335	377	12.33		

Nox Gas Cylinder 1275 PPm

SOx Gas Cylinder 1275 PPm

CO Gas Cylinder _____

CO2 Gas Cylinder 17.32%

Sign: NTPC

03/12/2020

(Munish).

Kota Power Instr. Co Pvt Ltd KOTA 324005

Kota Power Instr. Co Pvt Ltd KOTA 324005

मुनीष जैन
Munish Jain
अपर महाप्रबंधक (ईएमजी/एयुडी)
AGM (EMG/AUD)

CEMS CALIBRATION REPORT

UNIT 7 DATE: 27/01/21

Sr no	Gas Cal	NOx 0-1500 PPM	SO2 0-1500 PPM	CO2 0-40%	CO 0-1000 PPM	REMARKS
1	Zero Gas Before cal	0	1	2		
2	Zero Gas After cal	0	0	0		
3	Span Gas Before cal	1275	1285	17.54 %		
4	Span Gas After cal	1276	1286	17.55 %		
5	Sample Reading before	296	320	11.55 %		
6	Sample Reading After	299	300	11.40		

Nox Gas Cylinder 1275

SOx Gas Cylinder 1285

CO Gas Cylinder 17.54 %

CO2 Gas Cylinder _____

CEMS CALIBRATION REPORT

UNIT 8 DATE: 27/01/21

Sr no	Gas Cal	NOx 0-1500 PPM	SO2 0-1500 PPM	CO2 0-40%	CO 0-1000 PPM	REMARKS
1	Zero Gas Before cal	~~1275~~ 0	1	2		
2	Zero Gas After cal	0	0	0		
3	Span Gas Before cal	1275	1285	17.54 %		
4	Span Gas After cal	1274	1284	17.54 %		
5	Sample Reading before	320	336	11.36 %		
6	Sample Reading After	299	300	11.40 %		

Nox Gas Cylinder 1275

SOx Gas Cylinder 1285

CO Gas Cylinder 17.54 %

CO2 Gas Cylinder _____

Sign: NTPC

30/01/21.
(Jitendra Kumar)

Analyser Instt. Co. Sign: AICPL

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31

CEMS CALIBRATION REPORT

UNIT 9 DATE: 27/01/21

Sr no	Gas Cal	NOx 0-1500 PPM	SO2 0-1500 PPM	CO2 0-40%	CO 0-1000 PPM	REMARKS
1	Zero Gas Before cal	0	1	2		
2	Zero Gas After cal	0	0	0		
3	Span Gas Before cal	1275	1285	17.54%		
4	Span Gas After cal	1276	1284	17.55		
5	Sample Reading before	215	309	10.35%		
6	Sample Reading After	191	299	10.20%		

Nox Gas Cylinder 1275

SOx Gas Cylinder 1285

CO Gas Cylinder 17.54

CO2 Gas Cylinder _____

CEMS CALIBRATION REPORT

UNIT 10 DATE: 27/01/21

Sr no	Gas Cal	NOx 0-1500 PPM	SO2 0-1500 PPM	CO2 0-40%	CO 0-1000 PPM	REMARKS
1	Zero Gas Before cal	0	1	2		
2	Zero Gas After cal	0	0	0		
3	Span Gas Before cal	1275	1285	17.54%		
4	Span Gas After cal	1274	1286	17.55%		
5	Sample Reading before	100	307	11.10%		
6	Sample Reading After	96	300	11.20%		

Nox Gas Cylinder 1275

SOx Gas Cylinder 1285

CO Gas Cylinder 17.54%

CO2 Gas Cylinder _____

Sign: NTPC

Sign: AAEL

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32

NTPC	Vindhyachal

Calibration Report of CEMS Analysers

1. Instrument Details:

DESCRIPTION	Unit#11 NOx/SOx ANALYSER
MAKE	Sick
RANGE	0-1000 PPM
LOCATION	SITE
PERMISSIBLE ERROR	1 %
DATE OF CALIBRATION	05/01/2021
NEXT DUE DATE	05/04/2021

2. MASTER USED

NAME OF THE MASTER	STANDARD NOx/SOx GAS CYLINDER(900 ppm)

3. Observations:

Sr. No	Standard Value		Observed Value		Deviation
	Input	Desired output	Before Calibration	After Calibration	
	NOx Calibration				
1.	0 ppm	0 ppm	8 ppm	0 ppm	-
2.	900 ppm	900 ppm	880 ppm	905 ppm	5 ppm
	SOx Calibration				
3.	0 ppm	0 ppm	15 ppm	2 ppm	
4.	900 ppm	900 ppm	912 ppm	906 ppm	6 ppm

Maximum Observed Error: 6 ppm

Remarks: OK

Signature Of Person Performing Calibration:
Name: L R Sachan

Approved By: Praveen Panwar
Signature:

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एनटीपीसी लिमिटेड-विंध्याचल
NTPC Limited-Vindhyachal

NTPC	Vindhyachal

Calibration Report of CEMS Analysers

1. Instrument Details:

DESCRIPTION	Unit#12 NOx/SOx ANALYSER
MAKE	Fuji
RANGE	0-2000 PPM
LOCATION	SITE
PERMISSIBLE ERROR	1 %
DATE OF CALIBRATION	05/01/2021
NEXT DUE DATE	05/04/2021

2. MASTER USED

NAME OF THE MASTER	STANDARD NOx/SOx GAS CYLINDER

3. Observations:

Sr. No	Standard Value		Observed Value		Deviation
	Input	Desired output	Before Calibration	After Calibration	
	NOx Calibration				
1.	0 ppm	0 ppm	5 ppm	2 ppm	-
2.	1268 ppm	1268 ppm	1290 ppm	1275 ppm	8 ppm
	SOx Calibration				
3.	0 ppm	0 ppm	8 ppm	3 ppm	
4.	1348 ppm	1348 ppm	1360 ppm	1350 ppm	2 ppm

Maximum Observed Error: 8 ppm

Remarks: OK

Signature Of Person Performing Calibration:

Name: L R Sachan

Approved By: Praveen Panwar

Signature: Praveen

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NTPC Limited-Vindhyachal

U# 13	ANALYSER CALIBRATION SHEET-SOX/NOX/CO2				DATE: 15/07/2020
	BEFORE CALIBRATION VALUE	ZERO VALUE	SPAN VALUE	ADJUSTMENT	AFTER CALIBRATION VALUE
SOX	29 PPM	-2	482	—	34
NOX	115 PPM	-15	971	—	131
CO2					
SOX SPAN GAS CONC.	496 ppm				
NOX SPAN GAS CONC.	988 ppm				
CO2 SPAN GAS CONC.	33.20 %				
ZERO GAS CONC:	0.4% O_2				
REMARKS IF ANY:					

SIGNATURE
NAME Shailesh Verma
DESIG. Dy Mgr (QC)
DATE 15/7/2020

U# 13	ANALYSER CALIBRATION SHEET-SOX/NOX/CO2				DATE: 14/10/2020
	BEFORE CALIBRATION VALUE	ZERO VALUE	SPAN VALUE	ADJUSTMENT	AFTER CALIBRATION VALUE
SOX	45 PPM	4 PPM	490PPM	—	55 PPM
NOX	106 PPM	10 PPM	980 PPM	—	120 PPM
CO2					
SOX SPAN GAS CONC.	496 PPM				
NOX SPAN GAS CONC.	988 PPM				
CO2 SPAN GAS CONC.	33.20%				
ZERO GAS CONC:	0.4% (Oxygen)				
REMARKS IF ANY:					

SIGNATURE
NAME Shailesh Verma
DESIG. Mgr (QC)
DATE 14/10/2020

मुनीष जैन
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अपर महाप्रबंधक (ईएमजी/एचडी)

35

ty Monitoring Station (AAQMS)
BRATION REPORT

Customer NameNTPC VINDHYACHAL	
Station Name : AAQMS - 1	
Station Location : NH2 colony	
Analyser MakeThermo Fisher Scientific	

Date: 21/12/2020

on Standards (Gas/PM)		Agency	Concentration
SO2 Gas Cylinder		CHEMTRON	5 PPM
Nox Gas Cylinder		CHEMTRON	NO 5 PPM,
CO2 Gas Cylinder		CHEMTRON	993 PPM
Dynamic Multi Gas Calibrator			
Calibration Foil Kit for PM Analysers			

Gas Analyser	Zero Calibration		Span Calibration		Sample	Sample	Remark
	Zero	Span Reading (ppm/ppb)			Before	After	
	Old	New	Old	New			
SO2	2.8	0.20	92.60	100.00	33.30	31.10	ok
NO	2.3	0.70	30.40	33.30	4.90	3.40	ok
NO2	1.9	0.10	55.36	66.60	11.60	11.20	ok
NOX	4.2	0.80	85.76	99.90	16.90	14.60	ok
CO2	-15.1	0.01	1031.00	1034.00	475.00	470.00	ok

PM Analysers	Range	Amplification Factor		Sample	Sample	Remark
		Old Value	New Viue	Before	After	
PM 10	10000	6625	7739	62	61	ok
PM 2.5	10000	5256	6775	31	33	ok

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NTPC Limited-Vindhyachal

Ambient Air Quality Monitoring Station (AAQMS)

CALIBRATION REPORT

Customer Name :	NTPC VINDHYACHAL
Station Name :	AAQMS - 2
Station Location :	MGR
Analyser Make :	Thermo Fisher Scientific

Date:	21/12/2020

Calibration Standards (Gas/PM)	Agency	Concentration
SO2 Gas Cylinder	CHEMTRON	5 PPM
Nox Gas Cylinder	CHEMTRON	NO 5 PPM,
CO2 Gas Cylinder	CHEMTRON	993 PPM
Dynamic Multi Gas Calibrator		
Calibration Foil Kit for PM Analysers		

Gas Analyser	Zero Calibration		Span Calibration		Sample	Sample	Remark
	Zero Reading(ppm/ppb)		Span Reading (ppm/ppb)		Before	After	
	Old	New	Old	New			
SO2	4.2	0.21	93.10	100.00	15.50	13.60	ok
NO	2.1	0.30	30.30	33.30	4.70	4.20	ok
NO2	2	0.10	54.80	66.60	11.90	11.60	ok
NOX	4.1	0.40	85.10	100.00	16.60	15.80	ok
CO2	-20.7	0.10	1010.00	1019.00	438.00	470.00	ok

PM Analysers	Range	Amplification Factor		Sample	Sample	Remark
		Old Value	New Vlue	Before	After	
PM 10	1000	7012	6833	77	73	ok
PM 2.5	1000	6110	6811	52	44	ok

एस. सी. रंजन
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Thermo Fisher Scientific India Pvt. Ltd. Mumbai

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NTPC Limited-Vindhyachal

37

Monitoring Station (AAQMS)

ATION REPORT

Customer Name	NTPC VINDHYACHAL	
Station Name	AAQMS - 3	
Station Location	Pt plant	
Analyser Make	Thermo Fisher Scientific	

Date: 22/12/2020

Standards (Gas/PM)	Agency	Concentration
SO2 Gas Cylinder	CHEMTRON	5 PPM
Nox Gas Cylinder	CHEMTRON	NO 5 PPM,
CO2 Gas Cylinder	CHEMTRON	993 PPM
Dynamic Multi Gas Calibrator		
Calibration Foil Kit for PM Analysers		

Gas	Zero Calibration		Span Calibration			Sample	Sample	Remark
	Zero Readin	Span Reading (ppm/ppb)				Before	After	
	Old	New	Old		New			
SO2	4.1	0.20	92.35		100.00	32.70	30.20	ok
NO	3.2	0.50	29.30		33.40	3.90	2.40	ok
NO2	2.1	0.15	56.36		66.60	12.60	11.20	ok
NOX	5.3	0.65	85.66		100.00	15.50	13.60	ok
CO2	-21	0.04	1011.00		1054.00	477.00	481.00	ok

M Analysers	Range	Amplification Factor			Sample	Sample	Remark
		Old Value	New Vlue		Before	After	
PM 10	10000	7033	7765		67	62	ok
PM 2.5	10000	6643	6735		37	36	ok

Monitoring Station (AAQMS)

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Thermo Fisher Scientific India Pvt. Ltd. Mumbai

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NTPC Limited-Vindhyachal

38

Ambient Air Quality Monitoring Station (AAQMS)

CALIBRATION REPORT

Customer Name :	NTPC VINDHYACHAL
Station Name :	AAQMS - 4
Station Location :	Hindi school
Analyser Make :	Thermo Fisher Scientific

Date: 24/12/2020

Calibration Standards (Gas/PM)	Agency	Concentration
SO2 Gas Cylinder	CHEMTRON	5 PPM
Nox Gas Cylinder	CHEMTRON	NO 5 PPM,
CO2 Gas Cylinder	CHEMTRON	993 PPM
Dynamic Multi Gas Calibrator		
Calibration Foil Kit for PM Analysers		

Gas Analyser	Zero Calibration		Span Calibration		Sample	Sample	Remark
	Zero Reading(ppm/ppb)		Span Reading (ppm/ppb)		Before	After	
	Old	New	Old	New			
SO2	3.1	0.12	97.20	100.00	15.80	12.90	ok
NO	2.4	0.32	22.40	24.00	4.30	3.10	ok
NO2	3.2	0.14	53.30	61.00	10.50	12.30	ok
NOX	5.6	0.46	75.70	100.00	14.80	15.40	ok
CO2	-9	0.30	1025.00	1007.00	431.00	471.00	ok

PM Analysers	Range	Amplification Factor		Sample	Sample	Remark
		Old Value	New Vlue	Before	After	
PM 10	1000	7120	6949	78	71	ok
PM 2.5	1000	6542	6855	54	40	ok

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NTPC Limited-Vindhyachal

Annexure-4

39

100% ASH UTILIZATION PLAN

UOM: LMT

	2021-22	2022-23	2023-24
Expected Ash Gen	80	80	80
Ash Mound	0.50	1	2
Supply to Cement Plants through rail/road transportation	6	10	14
Utilisation in OB mixing* (*Subject to getting requirement from Mine Owner companies*)	2	13	32
Mines Filling	4	6	8
Waste land development	8	10	8
Brick Manu. & other Fly ash based industry	5	5	5
Road Construction	11	11	11
Ash Dyke Raising	9	8	0
Total AU	45.5	64	80
AU%	**55%**	**80%**	**100%**

Ash Utilization in 2020-21: 37.7 %

EXTERNAL SUPPORT REQUIRED

- Implementation of Demand side provisions of MoEF notification on fly ash utilization including mandatory use of fly ash bricks and OB mixing with fly ash.
- Creation of requisite rail/road infrastructure to support ash evacuation from the region to ensure 100 % ash utilization.
- Clearance for ash filling in GORBI mines.
- Early clearance of Waste Land Development proposals.

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NTPC Limited-Vindhyachal

40

Initiatives & Measures taken by NTPC Vindhyachal to improve ash utilization

1. Efforts are being made to start GORBI mine filling within a short period of time. Environment clearance from MPPCB has been given. Distt. Administration clearance awaited. NCL requested to obtain DGMS clearance for the work since as per the Mines act, NCL being the mine owner, DGMS clearance will not be given to NTPC directly.
2. Supply of fly ash to Cement Manufacturers started in July'20 under Incentive scheme for making it financially viable for them to lift ash from VSTPS.
3. VSTPS is regularly taking up the work of Waste Land Development of Govt/Publiv/Private land using fly ash at various locations within 100 kms of Plant radius. Total ash utilisation in this avenue was around 12.9 LMT in the financial year 2020-21.
4. VSTPS has been continuously following up with NHAI for getting requirement for ash in road construction. A requirement of about 10 lac MT has been received from NHAI, Varanasi and supply of ash has been started in Aug'20. Around 1.8 Lac MT ash was supplied under this arrangement in 2020-21. A requirement of around 4 Lac MT has been received for supply in SATNA region for which arrangements are being worked out. VSTPS is committed to provide ash to all projects under Pradhan Mantri Gramin Sadak Yojna and asset creation programmes of the Government involving construction of buildings, road, dams and embankments within 300 kms of the Plant as and when the requirement is received.
5. Efforts underway to maximise Ash Transportation by Rail so that the transportation cost can be reduced. Facility for direct loading of ash into rail wagons commissioned in one Unit. Rail loading facility for 2260 MW (Stg 1 & Stg 4) expected to be completed by Aug'21. Fly ash transportation by rail to Star Cement, Assam was done in Jan'21 on trial basis. NTPC is procuring 3 rakes of BTAP wagons for the purpose at a cost of ~ 60 crores (two rakes already delivered).
6. Ash park has been set up at Rewa where fly ash transported in 50 kg bags from VSTPS is made available to the ash based industries in theregion. Vindhyachal has been the first Plant in the region to start such an initiative. Ash bagging machines have been installed for the purpose in the SILOs at Vindhyachal. Bagging machines for Jumbo bag filling (1-1.5 T) are also planned to be installed.
7. VSTPS is supplying fly ash to the ash based industries within 100 kms from the Plant. Free of cost Door step delivery is being made. Again, Vindhyachal is the first Plant in the region to start such an initiative.
8. VSTPS is supplying fly ash to the ash based industries in 100 – 300 kms radius of the Plant on cost sharing basis as per the provisions of the MoEF notification on fly ash.
9. VSTPS is actively following up with Distt Administration for awarding any abandoned quarries which can be developed using ash. One no. of stone quarry was awarded to VSTPS in Makrohar region where ash filling has been completed.
10. VSTPS has approached IIT-Roorkee, IIT-Delhi and other vendors for construction of Ash Mound as a pilot project. Offer from IIT, Delhi has been received and is being processed.
11. VSTPS is making around 75,000 ash bricks/day for its own use. No red brick is used for any construction activity within Plant or township.
12. Consistent efforts are being made by VSTPS requesting NCL for mixing of fly ash with OB but so far the efforts have not yielded fruit.

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NTPC Limited-Vindhyachal

Annexure-5

Fly Ash Notification S.O. 2804 (E), 3rd November, 2009 – Statutory Compliance Report for the period 01.04.2020 to 31.03.2021

S. No.	Item	Reply
1	Name of Thermal Power Station	NTPC Limited,Vindhyachal Super Thermal Power Station
2	Full address including District & Pin code	PO: Vindhyanagar, Dist: Singrauli (MP), Pin - 486 885.
3	E-mail address	mukeshkashyap@ntpc.co.in
4	Name of the Nodal Officer (not below the rank of DGM / Dy. CE / or equivalent) dealing with ash/environment management and designation	Mukesh Kashyap AGM (AUD)
5	Contact No.	9650999621
6	Email:	mukeshkashyap@ntpc.co.in
7	Total capacity of the Thermal Power Station (MW) along with unit-wise capacity break-up	4760 MW

A. Coal Consumption and Ash Generation in year 2020-2021 (in tonnes)

8	Coal /Lignite Consumption	2,50,09,768
9	Average ash content in coal (annual)	34.84
10	Bottom Ash Generation	17,42,736
11	Fly Ash Generation	69,70,944
12	**Total Ash Generation (10 + 11)**	**87,13,679**

B. Ash utilization in year 2020-2021 (in tonnes)

S. No.	Purpose for which ash is utilized	From ESP Dry Ash (1)	From Pond Ash (2)	From Bottom Ash (3)	Total (1+2+3)
13	Cement industry	1,46,992	-	-	1,46,992
14	Bricks/blocks/tiles and other ash based products	2,28,398	-	-	2,28,398
15	Road and flyover embankments	-	1,77,709	-	1,77,709
16	Reclamation of low lying area	-	12,87,735	-	12,87,735
17	Back filling of mines	-	-	-	-
18	Concrete/ mortar/ plaster	-	-	-	-
19	Agriculture	-	-	-	-
20	Exports	-	-	-	-
21	**Others (please specify all avenues)**	-	12,70,781	1,74,273	14,45,054
	Total B (13 to 21)	3,75,390	27,36,225	1,74,273	32,85,888

Dy GM-ADM

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42

C. Unutilised ash of year 2020-21 and previous years

22	Unutilised ash ofyear 2020-21 (in tonnes)	54,27,791
23	Unutilised ash pertaining to previous years i.e. up to 31.03.2020 (in Million tonnes)	74.7469
24	Total unutilisedash up to 31.03.2021 (22 + 23)(in Million tonnes)	80.1746
	a. Quantity of Ash stored in Silos	---
	b. Quantity of Ash stored in Ash Ponds	80.1746
	c. Quantity of Ash stored in any other manner (please specifytype of storage and dry/wet phase)	-----

D. Reasons for not achieving 100% ash utilisation

1. NTPC Vindhyachal is remotely located distantly from the Bulk ash consumption belt, having limited scope of ash utilization.
2. NTPC Vindhyachal is located in the cluster of large power plants in Singrauli region due to which ash generation is in abundance, but utilization is limited.
3. As per CPCB guidelines & MoEF notifications, up to 25 % Fly ash is to be utilized in OB mixing on volume to volume basis. Station approached neighbouring NCL, however no positive response given by NCL.
5. Station has offered incentives to Cement companies for Fly Ash Lifting from VSTPS but the take off by Cement companies is lower than the target, due to poor conditions of road in MP region.
6. Station has started Pond Ash supply to NHAI for road construction work near Varanasi but the transportation is lower than target due to traffic congestion at Varanasi.

Signature and Seal of the Plant Head

Name:
Designation:
Date:

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Annexure-6

43

Initiatives & Measures taken by NTPC Vindhyachal to improve ash utilization

1. NTPC Vindhyachal has successfully started backfilling of GORBI mine from 15.07.2021. The one pit of the mine currently allotted to NTPC Vindhyachal has the capacity to cater to the needs of VSTPS for 10 years if 75 % ash utilisation is achieved in other avenues.
2. Cement manufacturers are being given incentive for ash lifting from VSTPS to share the transportation cost and make it financially viable for them. Cement Manufacturers are also being pursued to set up Clinker Grinder Units in the area. UP Government is providing support/subsidies for setting up Cement grinding units. Similar support is solicited from our State Government Authorities.
3. After constant follow-up with NHAI, a requirement of 10 Lac MT has been received from them for use in road construction in Varanasi area and ash supply through road transport is in progress. VSTPS is committed to provide ash to all projects under Pradhan Mantri Gramin Sadak Yojna and asset creation programmes of the Government involving construction of buildings, road, dams and embankments within 300 kms of the Plant as and when the requirement is received.
4. To meet the requirement of NHAI, Ash transportation by RCR mode (Road cum Rail mode) is also envisaged and a pilot project to transport 20,000 MT pond ash is underway. Tendering for the same is likely by August end.
5. Infrastructure and Facilities are being developed for start of ash transport through rail route to make the transportation economical and environment friendly. One rack of fly ash was transported to Star Cement, assam in Jan'21. NTPC is procuring 3 rakes of BTAP wagons at a cost of ~ 60 crores. Two racks have already been delivered. Direct rail loading facility for all the six Units of Stage 1 & both the Units of Stage 4 is under commissioning. Regular transport of ash through rail is likely to start in Aug'21.
6. 50 kg Ash Bagging Machines have been installed for transport of ash in bagged form to avoid fugitive dust. Jumbo Bagging Machine (3 Tonne) and Automatic Bagging Machine (1 Tonne) is also under procurement.
7. Ash park has been set up at Rewa where fly ash transported in 50 kg bags from VSTPS is being made available to the ash based industries in the region.
8. Free of cost Door step delivery of fly ash is being made to the ash based industries within 100 kms from the Plant.
9. Supply of fly ash to the ash based industries in 100 - 300 kms radius of the Plant on cost sharing basis is being done, as envisaged in the MoEF notification.
10. VSTPS is actively following up with Distt Administration for allotting any abandoned quarries which can be developed using ash. Ash filling in one no. of stone quarry allotted to VSTPS in Makrohar region has already been completed (~ 90,000 MT of ash filling was done).

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11. VSTPS is also doing free of cost land development using ash, as per CPCB guidelines, at various locations within 100 kms of Plant radius. Total ash utilisation in these contracts is expected to be around 10 LMT this year.
12. VSTPS is making around 75,000 ash bricks/day for its own use. No red brick is used for any construction activity within Plant ortownship.
13. VSTPS has been constantly requesting NCL for mixing of fly ash with OB as per the provisions of MoEF notification on Fly Ash but positive response from NCL has not been received. NGT/Pollution control authorities support is solicited to facilitate the same.
14. VSTPS is in dialogue with leading consultants for technical studies and feasibility of construction of Ash Mound. IIT, Delhi has given an initial proposal for pilot project.

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एनटीपीसी NTPC
A Maharatna Company

एन टी पी सी लिमिटेड
(भारत सरकार का उद्यम)
NTPC Limited
(A Govt. of India Enterprise)

विंध्याचल/ VINDHYACHAL

Annexure-7

Unit No.	Present Status	% of work completed	Expected Commissioning
1, 2, 3	Chimney piling work completed.	13	Sep'23
4, 5, 6	Chimney piling work in progress.	13	
7	Absorber system foundation work and chimney piling completed. Flue gas duct and Booster Fan foundation works started.	13	
8	Absorber system foundation work and chimney piling completed.	13	
9	Absorber system and Booster Fan foundation piling completed. Cable Trestle foundation works started.	48	June'23
10	Absorber system foundation work and Wet chimney foundation work completed.	48	
11	Absorber system, Chimney and Booster Fan piling work in progress.	48	
12	Absorber system works started. Flue gas duct, Booster fan piling work completed. Chimney erection started.	48	

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Annexure-8

IIT, Hyderabad Scope of Work summary

In order to ensure the healthiness of ash dykes of NTPC Vindhyachal, stability study has been carried out by IIT Hyderabad. Major works/ analysis can be summarised as follows:

i. Development of digital elevation models/any similar model in identifying any existing weak zones in the dykes using DJI Phantom 4 Pro equipped with GPS system and camera.
ii. SPT testing/similar testing methods: This will help in arriving at the profile and the properties of the starter and raising dykes. In-situ density, etc. will be found out.
iii. Collection of samples from site (at least 1-2 samples from each lagoon) to find out properties such as Shear Strength, Cohesion and Angle of Internal Friction.
iv. Stability analysis of all the lagoons using GeoStudio software (SEEP/w and SLOPE/w) or Slide software/similar software to check the stability analysis of existing dykes. These methods help in limit equilibrium analysis.
v. The stability analysis to be performed for different conditions (steady seepage, rapid drawdown, seismic loading, etc.
vi. All the lagoons with ultimate height raisings will be considered in the stability analysis under loads. Slope stability analysis will be carried out for different loading conditions.
vii. Water level observations in Piezometers, if any
viii. Locational Settlement /Settlement Gauges monitoring data, if any
ix. Recommendations about the healthiness of existing ash dykes including remedial measures, if any

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Annexure-9

REPORT ON FEASIBILITY STUDY FOR CONSTRUCTION OF RCC WALL AROUND ASH DYKES OF NTPC VINDHYACHAL

N. K. Samadhiya

Professor, Department of Civil Engineering, IIT Roorkee

1.0 INTRODUCTION

Er. Rishi Kapoor, Deputy General Manager (Ash Dyke-Civil) NTPC Ltd. VSTPS, Vindhyachal, Madhya Pradesh vide e-mail dated October 26, 2020 requested Prof N.K. Samadhiya, Department of Civil Engineering, Indian Institute of Technology (IIT) Roorkee regarding site visit and feasibility study for construction of RCC wall around ash dykes of NTPC Vindhyachal in Shahpur area in the light of recommendations of Honorable NGT. The proposal was sent by Dr. N. K. Samadhiya, Professor, Department of Civil Engineering, IIT Roorkee vide letter No. CED/GTE/NKS/2210 dated November 10, 2020. The acceptance of the proposal was communicated by Mr. Amit Kumar Saha, Senior Manager (CS), SSC NR Vindhyachal vide Purchase Order No. 4000250830 - 026-1018 Dated 16.12.2020. A site visit was undertaken by Prof N K Samadhiya on April 04, 2021 for assessing the feasibility of RCC retaining wall around the dykes.

This report is based on the observations at site and the information provided by NTPC, Vindhyachal. The recommendation has been made on the basis of technical requirements of the stability of dykes.

2.0 GENERAL

NTPC Vindhyachal is a coal based thermal power plant with installed capacity of 4760 MW. It is the India's largest thermal power plant, situated at Vindhyagar, Singrauli, Madhya Pradesh. This power plant generates around 07 million m^3 of ash annually. Fly ash generated at NTPC Vindhyachal is mainly utilized in supply to cement manufacturing, ash brick manufacturing and other ash-based products manufacturing industries, NHAI for road construction, raising and buttressing of ash dykes, wasteland development works using pond ash etc. Balance ash is safely disposed of and is stored in ash dyke lagoons. NTPC Vindhyachal has six ash dyke lagoons viz. V-1, V-2, V-3A, V-3B, located in Shahpur area

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and V-4A & 4B located in Baliyari area.

3.0 ASSESSMENT OF EXISTING ASH DYKE STRUCTURE & ITS STABILITY

Unlike water reservoir, the dyke embankments for ash pond are generally not constructed up to ultimate height in one go and initially constructed up to a limited height with provision of subsequent raising as per requirement. Ash dyke lagoon is provided with garlanding arrangements for changeover of the ash slurry feed points for even filling of the pond and for effective settlement of the ash particles. Having two or more storage lagoon facilitates sequential raising of lagoons by putting one lagoon for ash filling while the other lagoon is used for raising its dyke. Overflow lagoon helps in controlling the effluent quality of the supernatant, which is recycled back to plant for making ash slurry. The ash disposal areas of Vindhyachal STPS is located in earthquake Zone-III as per IS: 1893.

The Starter dyke and subsequent raisings of different ash dyke lagoons are finalized and constructed in stages based on the ground topography, foundation soil conditions, availability of construction material and storage requirements etc. The requirements for design of dyke embankments are to ensure; safety against slope stability, safety against internal erosion and safety against overtopping. Accordingly, the structural design of ash dyke embankments of Vindhyachal STPS has been checked for stability in all critical states under Static and Earthquake conditions as per IS codes and found to be safe.

As per the instructions of honorable NGT, to check the structural adequacy of the VSTPS dykes, a scientific evaluation of the constructed ash dykes has been done independently by IIT-Roorkee. Based on the evaluation report of IIT Roorkee (copy enclosed), it is established that design of ash dyke embankments of Vindhyachal STPS has been carried out as per prevailing engineering practices and found to be safe.

Further, with the recommendations of IIT-Delhi, NTPC Vindhyachal is carrying out the berm stabilization of V2 dyke for its further strengthening from toe of starter dyke towards the reservoir as per the sketch of Fig.1. Photographs 1 to 3 show the work being carried out.

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49

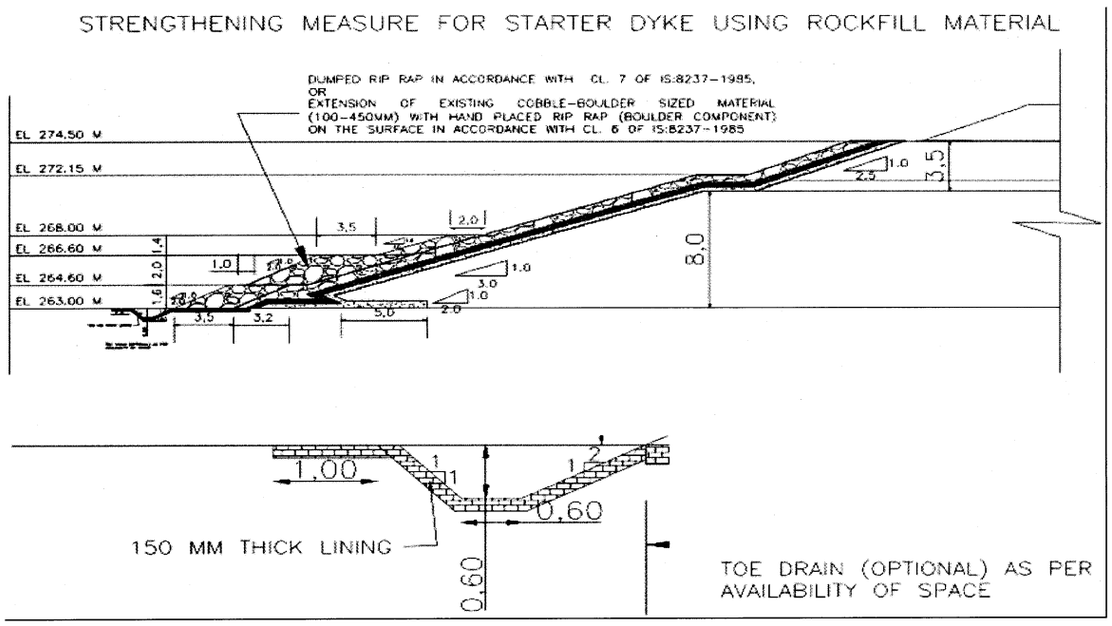
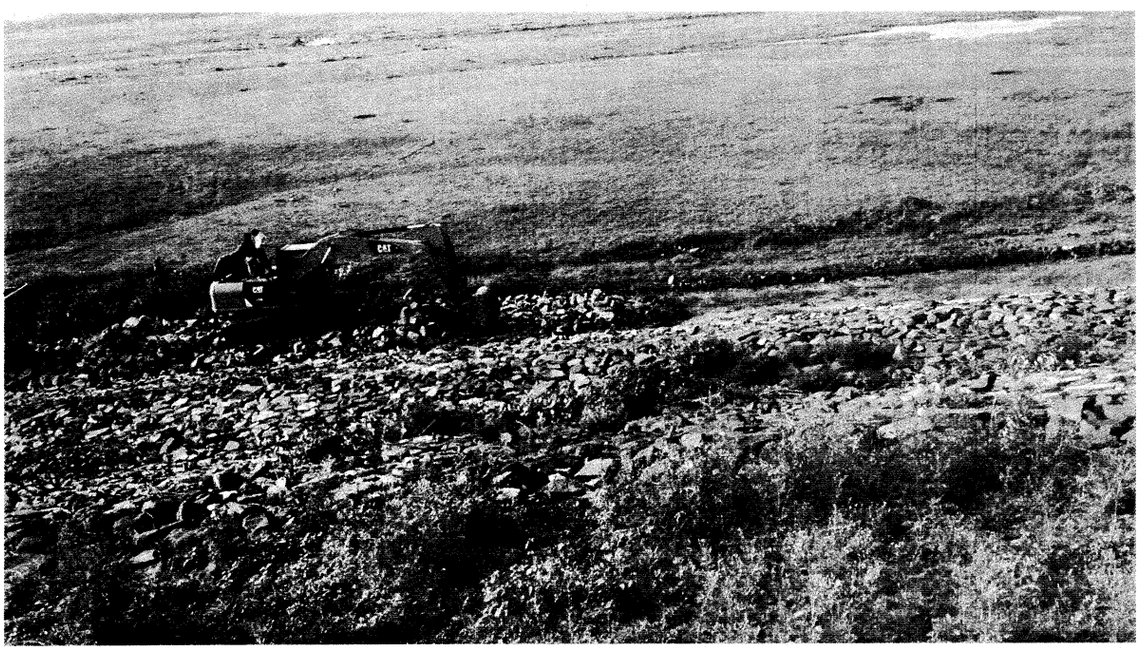


Fig. 17: Strengthening of starter dyke using rockfill material

Fig-1-Proposed Section for Berm Stabilization with Rockfill (As per IIT Delhi)



Photograph 1

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Photograph 2

Photograph 3

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This additional two levels of berm stabilization involving around 45,000 cum of rockfill will provide additional FOS to dyke, taking it beyond the required values of 1.5 for dynamic conditions. As per the site conditions also, at many stretches of reservoir where slushy bed is encountered, there additional strengthening with 2-3 layers of boulders (each 300 mm thick) is also being done, this will add to the berm stabilization along the starter dyke of reservoir.

4.0 ASSESSMENT ON FEASIBILITY OF RETAING WALL

In NTPC, the unused ash is stored in ash dykes and in order to optimize the use of land, the ash dyke is constructed in stages as shown vide Fig-2 below.

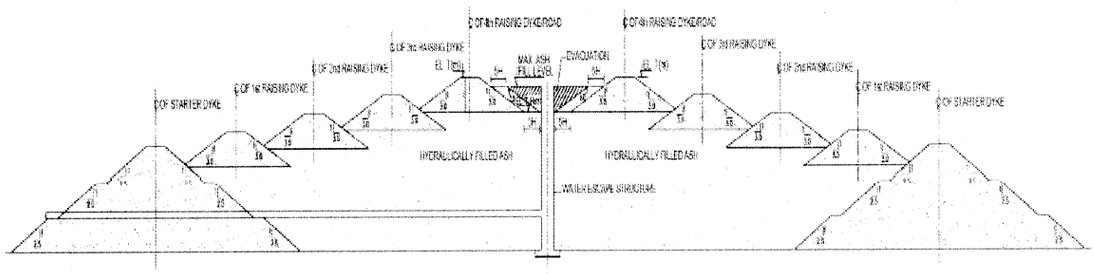

Fig. 2 – Typical upstream raising of ash dykes

The height of bottom most dyke or starter dyke varies from 1 m to 15 m depending on the initial ground topography, while the subsequent raisings being 3 m high each. As the construction and filling of the dykes proceed upwards, the lower layers of deposited ash are consolidated and not amenable to breach as they have very low water content. The risk of breach, if any, exists at the top most working dykes which have ash slurry stored in it and receive the rainwater during monsoons.

The construction of RCC wall rising from the bottom of the dyke implies extensive rigid structure running into several Kilometers in length and to be more than 15-20 m high to be of any use in stopping the deluge of ash slurry in case of a breach. The natural ground level is highly undulating along dyke toe. The strata below ground level, water table along the dyke alignment is also varying. Further, the ash dykes V1, V2, V3A and V3B of Vindhyachal STPP are located in peninsular region of the Rihand reservoir and the outer

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periphery of the dykes are submerged in water during high water levels in the reservoir as shown vide Fig. 3. Out of the total 19km of peripheral length of dykes in Shahpur area (V-1, V-2, V-3A and V-3B), 9km is surrounded by the Rihand reservoir.

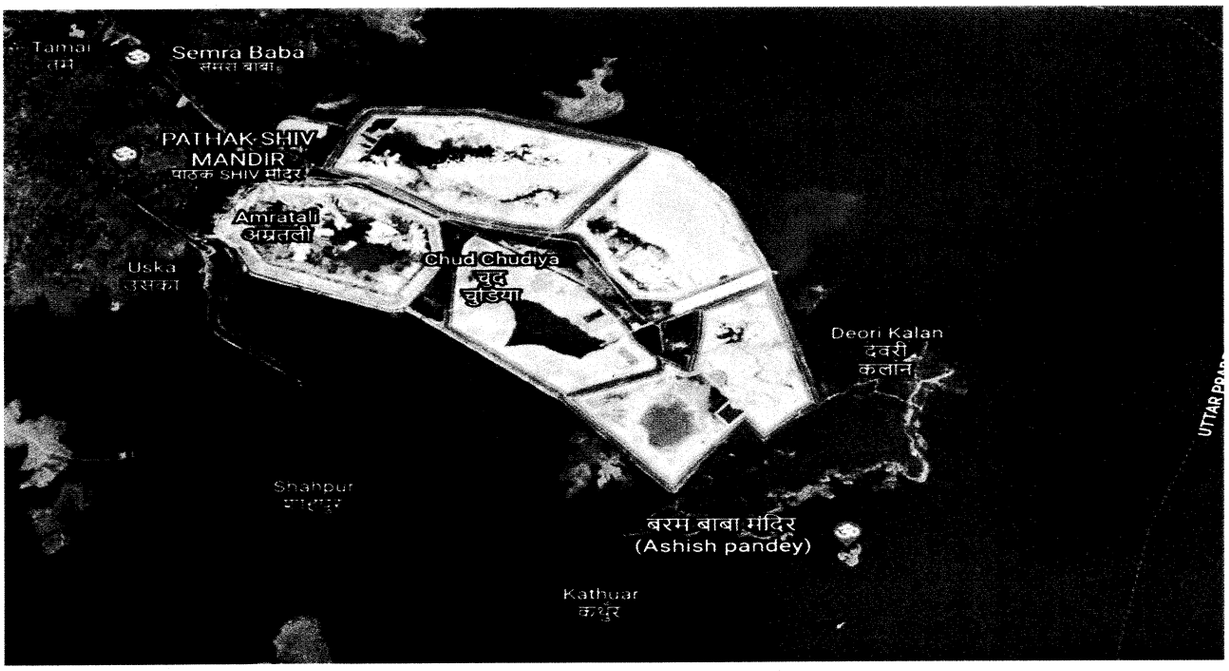

Fig. 3 – Layout and location of Shahpur ash dykes

Construction of RCC wall around dyke toe will require significant depth of excavation for its foundation along dyke toe and in submergence areas of Reservoir, which is not advisable on account of dyke safety. The construction of RCC wall at the toe of the working dyke (i.e. that of the present raising in service) is not feasible as the working ash dykes themselves are resting on the ash deposits of earlier raisings.

Additionally, the RCC wall will create hindrance in regular operation and maintenance of ash dykes and associated ash handling systems.

5.0 RECOMMENDATION ON FEASIBILITY OF RETAING WALL

The conventional method of construction of ash dykes comprises of a starter dyke constructed with the locally available material and the raisings with the fly ash. The slopes of both the starter and raisings are kept mild so that the factor of safety of the dykes remains well above the minimum values. In the case of Vindhyachal dykes, all the

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requirements are met with. It has also been established that the ash dyke embankments of Vindhyachal STPS are safe in all critical states under Static and Earthquake conditions, as per IS codes, by the stability analysis carried out by NTPC and independently by IIT-Roorkee. Further, the berm stabilization of V2 dyke for its further strengthening from toe of starter dyke towards the reservoir will enhance the stability.

The retaining walls to support the starter dykes are provided if there is restriction of the space due to which mild slopes cannot be provided. However, there is no such requirement for Vindhyachal dykes.

If the requirement of a retaining wall is considered from the point of view of storage of the fly ash slurry behind the retaining wall so that it does not enter in to the adjoining private property in the eventuality of dyke failure, the height requirement will be of the order of 15 to 20m. Corresponding width of the retaining shall be of the order of 9 to 12m. Further the retaining wall will have to designed for the impact load which will necessitate huge section. Such a construction is not feasible at the site.

Also the dykes cannot be augmented by provision of RCC retaining wall since out of the total 19 km perimeter of V-1, V-2, V-3A and V-3B dykes, 9km is surrounded by the Rihand reservoir where there is no space available to accommodate the required width of the foundation of such a retaining wall. Most length of the left-over perimeter is in the areas where dyke boundaries face each other and as such no spill over outside NTPC premises will take place.

Thus, the construction of RCC wall around the ash dykes is neither feasible from technical point of view nor required as the existing dykes are found to be structurally safe having adequate margin of factor of safety as per codal provisions of IS codes.

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(Prof. N.K.Samadhiya)

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Subject: Original Application No. 164/2018: Ashwani Kumar Dubey Vs. Union of India & Ors.

From: Shailesh Madiyal <shaileshmadiyal@salvuspartners.com> on Mon, 22 Nov 2021 17:38:57

To: <ashwanik.advocate@gmail.com>

Cc: "Shailesh Madiyal " <admin@salvuspartners.com>

1 attachment(s) - RESPONSE_OF_THE_VINDHYACHAL_SUPER_THERMAL_POWER_STATION_LTD..pdf (11.57MB)

Dear Sir,

Please find attached, the scanned copy of the Response of Vindhyachal super thermal power plant [NTPC-Vindhyachal] to the quarterly status report filed by the joint committee in the above mentioned matter.

This is for your information and record.

Warm Regards

Amit Mishra

FOR

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