

MINUTES OF THE 30th MEETING (SPECIAL) OF THE RE-CONSTITUTED EXPERT APPRAISAL COMMITTEE (EAC) ON ENVIRONMENTAL IMPACT ASSESSMENT (EIA) OF THERMAL POWER PROJECTS HELD ON 12th JULY, 2019.

The 30th Meeting of the re-constituted EAC (Thermal Power) was held on 12th July, 2019 in the Ministry of Environment, Forest & Climate Change at Indus Meeting Hall, Jal Wing, Ground Floor, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi under the Chairmanship of Dr. Navin Chandra. The following members were present:

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|---------------------------|------------------------------------|
| 1. Dr. Navin Chandra | - Chairman |
| 2. Dr. N.P. Shukla | - Member |
| 3. Shri N. Mohan Karnat | - Member |
| 4. Dr. Jai Krishna Pandey | - Member |
| 5. Shri N.S. Mondal | - Member (Rep. of CEA) |
| 6. Dr. S.K. Gupta | - Member (Rep. of ISM/IIT Dhanbad) |
| 7. Dr. S.K. Paliwal | - Member (Rep. of CPCB) |
| 8. Dr. S. Kerketta | - Member Secretary |

Shri Suramya D. Vora, Shri G.P. Kundargi, Dr. Sharachchandra Lele, Dr. Manjari Srivastava and Dr. R.K. Giri (Representative of IMD) could not be present. Shri A.N. Singh, Scientist "E", HSMD, Shri Munna Kumar Shah, Scientist "D", IA (Coal Sector), Shri N. Subrahmanyam, Scientist "C", IA (Thermal Sector), Ministry of Environment, Forest and Climate Change, New Delhi were also present in the Special EAC meeting.

Item No.30.0: CONFIRMATION OF THE MINUTES OF THE 29th EAC MEETING.

The Minutes of the 29th EAC (Thermal Power) meeting held on 26.6.2019 were confirmed in presence of members present in the meeting.

Item No. 30.0: CONSIDERATION OF MATTERS

(30.1) Review of Guidelines prepared by CPCB and CIMFR for Flyash disposal in low lying areas & abandoned mines and review of conditions and conditions prescribed in the Environmental Clearance of Thermal Power Projects in line with the Flyash Notification- reg.

(30.1.1) The issue of reviewing the EC conditions in line with the Fly Ash Notification was discussed by the EAC members in its meeting held on 28.5.2019. Committee has been informed that the guidelines for disposal of ash in abandoned mines are under preparation by the CPCB. Accordingly, Committee recommended that these conditions may be suitably amended in line with the Flyash Notification once the suitable

guidelines are framed for safe disposal of ash in low lying areas and abandoned mine voids and made available to Project Proponents.

(30.1.2) As the Guidelines on 'Disposal of Flyash for reclamation of low lying areas and in stowing/backfilling in abandoned mines' have been prepared by the CPCB with the help of CIMFR, the same guidelines have been placed before the Committee for its review and also to provide opinion.

(30.1.3) The report primarily describes the methodology for ash disposal in low lying areas, abandoned mines and dumping along with overburden in opencast mines. The guidelines pertaining to disposal of ash in low lying area is as follows:

- i. Consent from land owner in writing should be obtained before start of work.
- ii. Power Plant owner/agency shall obtain statutory permission from regulatory authorities such as SPCB as per the requirement.
- iii. Suitable methods should be adopted and necessary arrangement should be made to prevent pollution during excavation of pond ash at ash pond, filling area and during transportation of ash.
- iv. Soil cover shall be excavated from land fill site itself and kept separately before starting ash filling. If it is not possible to do so, only the minimum quantity of soil required for the purpose of cover shall be excavated from the borrow area. The voids so created due to removed soil shall be filled up with ash with proper compaction and covered at top with soil cover of about 30-50 cm thick soil layer.
- v. If any water body exists within or adjoining the low lying area, then an earthen protective embankment to be constructed with height of 2 feet to protect the spilling of ash into the adjacent water body, low lying areas, etc.
- vi. After filling the low lying area, top soil shall be covered for growth of vegetation.
- vii. Reclamation of area by ash shall not be permitted in the following areas:
 - a. Flood plain areas
 - b. Agriculture land/areas
 - c. Gochar Kisan Land
 - d. Reclamation of forest land/area except with the permission issued under Forest (Conservation) Act, 1980.
- viii. It is the responsibility of thermal power plant operator to ensure that no air and water pollution during excavation, transportation and filling of the low lying areas caused.

(30.1.4) The following are the salient guidelines for disposal of ash in abandoned mines:

- i. The power plant authority shall carry out following studies prior to taking up ash disposal activities in mine voids to ensure no damage to water quality and hydrology in around the disposal areas.

- a. Ash characterisation and Leachate Study;
 - b. Techno-Economic Feasibility Study for disposal of ash into the quarry;
 - c. Feasibility of transportation of ash into mine voids;
 - d. Geo-technical study of the pipeline corridor and mine void area;
 - e. Pre and post filling mine water quality including leachability of metals.
- ii. Mode of transportation to mine voids shall be through pipeline using pneumatic conveying system, pipeline using wet disposal/lean or high concentration slurry disposal, dumpers/trucks, Merry Go Round (MGR) System and Belt Conveyors in case of dry disposal.
- iii. The following environmental parameters shall be monitored during ash disposal in the mines as well as reclamation of mine voids:

Sample	Parameters to analysed	Frequency
Ash Samples	Chemical Parameters (%): SiO ₂ , Al ₂ O ₃ , Fe ₂ O ₃ , K ₂ O, TiO ₂ , CaO, MgO, Na ₂ O, P ₂ O ₅ , SO ₃ Trace Elements (mg/kg, using, TCLP Test): As, Ba, Cd, Co, Cr, Cu, F, Fe, Hg, Mn, Ni, Pb, Zn Radio-activity (Bq/kg): ²³⁸ U, ²³⁶ Ra, ²³² Th, ²²⁸ Ra, ²³⁰ Pb, ⁴⁰ K, ¹³⁷ Cs	Once before initiation of filling
Ash Leachate Analysis	Trace Elements (mg/kg, using, TCLP Test): As, Ba, Cd, Co, Cr, Cu, F, Fe, Hg, Mn, Ni, Pb, Zn	Once a year
Piezometer Water Samples	Chemical Parameters (mg/l, expert, pH and EC): pH, EC, TDS, Total Alkalinity, Ca, Mg, Na, K, Cl, SO ₄ , NO ₃ , PO ₄ , Trace Elements (mg/l): As, Ba, Cd, Co, Cr, Cu, F, Fe, Hg, Mn, Ni, Pb, Zn	Monthly
Mine Water Samples	Same as above	Monthly
Ground Water	Same as above	Twice a year- Pre-monsoon and Post-monsoon
Surface Water Samples	Same as above	Twice a year- Pre- monsoon and Post-monsoon

Soil Samples	Texture, type, pH & cation exchange capacity. Trace Elements (mg/l): As, Ba, Cd, Co, Cr, Cu, F, Fe, Hg, Mn, Ni, Pb, Zn	Once a year
Survey of Flora and Fauna	<ul style="list-style-type: none"> • Listing of Flora (herbs, shrubs and trees) and Fauna (soil invertebrates and other animals) based on field observations and review of information available • Analysis of trace elements in plants (herbs, shrubs and trees), the invertebrates • Analysis of trace elements in aquatic fauna from the mine void filled with fly ash 	Once in two years

iv. The following environmental parameters shall be monitored after reclamation of mine voids:

Sample	Parameters to analysed	Frequency
Piezometer Water Samples	Chemical Parameters (mg/l, except, pH and EC): pH, EC, TDS, Total Alkalinity, Ca, Mg, Na, K, Cl, SO ₄ , NO ₃ , PO ₄ . Trace Elements (mg/l): As, Ba, Cd, Co, Cr, Cu, F, Fe, Hg, Mn, Ni, Pb, Zn.	Twice a year-Pre-monsoon and Post-monsoon
Ground Water	Same as above	Once a year- Pre-monsoon
Surface Water Samples	Same as above	Once a year- Pre-monsoon
Survey of Flora and Fauna	<ul style="list-style-type: none"> • Listing of Flora (herbs, shrubs and trees) and Fauna (soil invertebrates and other animals) based on field observations and review of information available • Analysis of trace elements in plants (herbs, shrubs and trees), the invertebrates • Analysis of trace elements in aquatic fauna from the mine void filled with fly ash 	Once in five years

- v. In the event of deterioration of environmental quality, the same will be reported to the concerned SPCB immediately and suitable preventive/corrective actions will be undertaken.
 - vi. After the mine/quarry is filled up to the permitted height as per DGMS guidelines, the same shall be covered with soil cover and by raising three tier plantation.
 - vii. Storm water drains shall be constructed for channelizing the runoff away from the disposal site.
 - viii. A 30 cm thick soil cover shall be provided on top of the filling material to promote vegetation growth.
 - ix. Appropriate measures should be taken to prevent entry of cattle/livestock inside the disposal area during execution period.
 - x. Water sprinkling for dust suppression during handling of ash shall be carried out to prevent air borne dust.
 - xi. Necessary clearances shall be obtained from the concerned agencies such as DGMS, SPCB, IBM, MoC, etc.
- (30.1.5) The following methodology which was approved for by DGMS in case of M/s JSPL and M/s JPL may be adopted for mixing of ash along with overburden for disposal in opencast mines:
- i. Distance of over burden dump area from the working face shall not be less than 100 m.
 - ii. The area of filling ash shall be earmarked and disposal shall be carried out in accordance with the plan.
 - iii. Height of each deck shall not be more than 30 m and the total height of the dump shall not exceed 90 m.
 - iv. The flyash shall be dumped in alternate layers of height not exceeding 5 m in each layer.
 - v. Initially a row of OB dumps not less than 15.0 m width shall be dumped of height up to 5 m all around the area proposed for ash dump over a deck (of 30 m height) of only overburden dump adequately compacted.
 - vi. Number of such areas shall be formed in a layer wherein the fly ash shall be dumped so that one dump of fly ash is separated by another with 15 m overburden dump.
 - vii. Thereafter, flyash (25%) and overburden shall be dumped within the area surrounded by such OB dumps. The dumping of Overburden and fly ash shall be done alternatively with the section of 5 m height. The deck of such mixing shall not exceed the height of 30 m and the distance between two consecutive decks shall not be less than 30 m. Each layer is adequately compacted by dozing.
 - viii. At the top of the dump, soil layer of 2 m thick shall be covered for development of greenbelt. The slopes shall be adequately covered with plantation, geo-synthetic and coir/jute reinforcement to prevent erosion. Gully drains along the slope of the dump and toe walls and peripheral drains to collect rainwater and silt be provided.

- ix. Each deck of OB dump shall not be more than 30 m and slope of the dump shall not exceed 28° or angle of repose whichever is less. Width of OB dump shall not be less than 40 m and overall slope of the dump shall not exceed 21°.
- x. Geo-technical study shall be conducted to assess the stability of the dump and the monitoring of various parameters during the course of dumping and also till the mine is closed permanently.
- xi. An approval from DGMS shall be obtained for each case of fly ash disposal.
- xii. The quality of ash is tested chemically and physically once in every quarter to ensure that it is free from Silica and toxic dust, if present shall be brought within safe limits.
- xiii. The Surface and ground water measurement (Chemical Parameters (mg/l): pH, EC, TDS, Total Alkalinity, Ca, Mg, Na, K, Cl, SO₄, NO₃, PO₄, Trace elements (mg/l): As, Ba, Cd, Co, Cr, Cu, F, Fe, Hg, Mn, Ni, Pb, Zn) shall be carried out once in a year (preferably before post monsoon) in consultation with the SPCB.
- xiv. Provision of check dams with adequate width and section shall be made around the OB to ensure that the sludge material shall not flow into any river, Nallah or water body along with the flyash.
- xv. A scientific study shall be carried out by an independent scientific organisation to study the impact of ash filling on flora, fauna, aquatic lives and Habitation (once during the filling and then after the end of filling).
- xvi. In case of any adverse impact is observed, it should be brought to the notice of the DGMS, SPCB and MoEF&CC and the Central Government. No further use of fly ash shall be done till it is permitted by the DGMS.

(30.1.6) The committee agrees with the guidelines prepared by CPCB for disposal of flyash in low lying areas, abandoned mines and working opencast mines. Committee has opined that if the complete flyash is allowed to be disposed in the mine void, there will not be any lateral movement of groundwater in aquifer as the ash will form an impermeable solid mass. Further, Committee opined that a layer of soil or earth material of thickness 1 m at every 5 m interval of flyash layers may be provided for lateral groundwater movement. However, the operational difficulties are also to be considered. The committee also noted that the disposal of ash in the mine voids shall be through wet disposal only so that air pollution is controlled due to dry disposal. Further, the top of the disposal area should always be kept moist to prevent air borne dust.

W.r.t. application of fly ash in agriculture as soil conditioner, the suitable quantities are to be recommended by the State Agricultural Universities and a certificate to that effect is to be obtained. Only, then the ash is to be applied in the agriculture fields.

(30.1.7) Committee after detailed deliberations, made the following recommendations to amend the existing EC conditions in line with the Flyash Notification:

- i. The guidelines prepared by CPCB for disposal of flyash for reclamation of low lying areas and in stowing/backfilling of abandoned mines/quarries shall be followed during disposal of ash in abandoned or working mines.
- ii. There should at least be clearance of 500 m of safe distance be maintained from River, Nallah and water body in case of ash disposal in abandoned mines to prevent embankment failures and flyash flowing into the nearby water body.
- iii. The top layer of the flyash disposal area in the abandoned mines shall be kept moist during disposal.
- iv. Top layer of the disposed area should have 70 cm overburden or gravels/stones and then 30 cm sweet soil cover. Subsequently, the vegetation shall be raised on the soil cover.
- v. Bioaccumulation and bio-magnification tests shall be conducted on surrounding flora and fauna (tree leaves, vegetation, crop yields and cattle population) during pre-monsoon and post monsoon to find out any trace metals escaped through groundwater or runoff.
- vi. Surface runoff and supernatant water, in any case shall not be let into the surrounding areas. It shall be collected by providing adequate drains around the mine. The supernatant water along with surface runoff shall be treated and re-used for mixing ash and plant operations.
- vii. To the extent possible, only decanted water from mine, make up water from treated effluents such as cooling tower blow down and treated sewage water shall be used for making ash slurry.
- viii. Flyash to be used as soil conditioner in agriculture needs and to be applied in controlled manner to limit excessive application so as to prevent soil degradation. The optimize proportion of ash to be applied which is to be certified by the State Agricultural Universities/Colleges based on the soil testing.
- ix. Approval from DGMS shall be obtained before disposing the ash in the mine voids.
- x. Technology for conversion of fly ash into coarse granules for stowing in the underground mines to be explored.
- xi. All the power plants should install different silos for dry collection of flyash.
- xii. Records pertaining to details of month-wise quantity of flyash disposed and water consumption along with nature/source of water shall be maintained and submitted to Ministry/Regional Office annually.

(30.2) Review of need for Environmental Clearance for High Tension Power Transmission lines- reg.

(30.2.1) The matter regarding requirement of Environmental Clearance for HT Transmission Lines has been raised by the Parliament Member under Rule 377. The matter has been referred to the Policy Sector of Impact Assessment Division for examination as the amendments and other changes in the EIA Notification is carried out by the Policy Sector. It has been decided that the matter may also be referred to the EAC Thermal Power for providing recommendations. The Policy Sector mentioned that the recommendations of EAC (Thermal Power) will be considered by the Expert Committee on Policy matters. Accordingly, the matter has been placed before the EAC (Thermal Power).

(30.2.2) The salient points for inclusion of High Tension Power Transmission lines in the EIA Notification as mentioned by the Parliament member are as below:

- i. The EIA Notification, 2006 is a major tool for minimizing the adverse impact of rapid industrialisation on environment.
- ii. High tension transmission/power lines cause various long-term and short term health hazards to the humans, plants and animals.
- iii. The health effects caused by transmission lines have been substantiated by the studies conducted by World Health Organisation and various other researchers.
- iv. Tube light held on bare hands beneath the transmission lines would lighten and brighten up without any Physical Electricity connection which is due to electro-magnetic Force (EMF) induced by the power lines.
- v. Agriculture workers are the most affected due to exposure of EMF and they are not aware of the exposure.
- vi. No Environmental and Social Impact Assessment Studies have been conducted regarding transmission lines in India.
- vii. Creation of awareness by way of consultation of the affected land owners/farmers of the transmission projects is essential before commencing such projects.
- viii. The EIA Notification provides for Public Consultation process by which concerns of affected persons and others who have plausible stake in the environmental impacts of the project are taken into consideration.

ix. Accordingly, why power transmission project be brought under the purview of the EIA Notification under Category 'A' projects for addressing environmental and social impacts.

(30.2.3) Committee noted that the transmission lines are linear projects which involve land acquisition for installing transmission towers and RoU acquisition for passing HT lines between the two towers. As per the extant guidelines, the project of transmission lines does not attract EIA Notification and hence does not require prior Environmental Clearance. However, if these lines are proposed in the forest land and in the protected areas notified under Wildlife (Protection) Act, 1972, the forest clearance under Forest (Conservation) Act, 1980 and recommendations of SC-NBWL, respectively are required before construction of transmission lines. Further, the transmission lines passing through eco-sensitive and eco-fragile zones/areas, a permission from the Regional Monitoring Committee under these notifications is required. Now, the main issue is with respect to the transmission lines passing through non-forest area/revenue land, whether provisions of EIA Notification, 2006 be mandated.

Committee noted that the project does not generate emissions and effluents. Unlike pipelines, there is no disturbance of land along the entire route except at the location of towers at several intervals. As per existing guidelines, the laying of pipelines passing through Protected areas and eco-sensitive areas require Environmental Clearance. Further, w.r.t impacts on birds and other avi-fauna due to transmission lines, the MoEF&CC had already published guidelines on '**Mitigation of Ecological Impacts of Linear Infrastructure on Wildlife**' in consultation with Wildlife Institute of India. These guidelines may be followed by the companies laying HT lines. Committee noted that other issue with the HT lines is the safety of the people residing and cultivating nearby to the area. In this connection a guidelines may be prepared by CPCB in consultation with CEA.

(30.2.4) **Committee after detailed deliberations opined that the Environmental Clearance for HT Power Transmission lines may not be necessitated. A guidelines for human safety and their health may be framed by the CPCB in consultation with Central Electricity Authority. In the EAC meeting, the Committee opined that the above recommendations of the EAC (Thermal Power) may be considered by the Ministry and a separate call to frame an adequate guidelines be taken so as to meet the optimum requirement of human safety and health .**

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As there being no agenda item left, the meeting ended with a vote of thanks to the Chair.


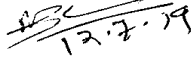
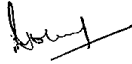
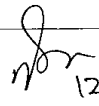
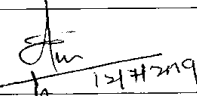
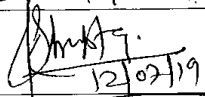
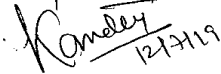
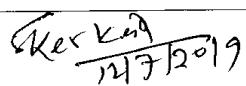
Attendance Sheet

30th SPECIAL EXPERT APPRAISAL COMMITTEE MEETING (Thermal)

DATE & TIME : 12th July 2019, 11:00 AM

VENUE : Indus Hall, Jal Wing, Ground Floor, Indira Paryavaran Bhawan, New Delhi

Subject : Amendment of Conditions in the Environmental Clearance related to Flyash Utilisation in-line with the Flyash Notification and deliberations on the guidelines prepared by CPCB and CIMFR on Flyash disposal in abandoned mines.

Sr.No.	Name of Member	Signature
1.	Dr. Navin Chandra Chairman	
2.	Shri Suramya D. Vora, IFS (Retd.) Member	Absent
3.	Dr. Narmada Prasad Shukla Member	 12.7.19
4.	Sh. N. Mohan Karnat, IFS Member	 12/7/2019
5.	Dr. Sharachchandra Lele Member	Absent
6.	Sh. N.S. Mondal, CEA Member	 12/7/19
7.	Dr. R.K. Giri, IMD Member	Absent
8.	Dr. S.K. Paliwal, CPCB Member	 12/7/2019
9.	Prof. S.K. Gupta (ISM/ IIT Dhanbad) Member	 12/07/19
10.	Dr. Jai Krishna Pandey Member	 12/7/19
11.	Dr. Manjari Srivastava Member	Absent
12.	Dr. Gururaj P Kundargi Member	Absent
13.	Dr. S. Kerketta Member Secretary, MoEFCC	 12/7/2019

30th SPECIAL EXPERT APPRAISAL COMMITTEE MEETING (Thermal)

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S. No.	Name and Designation	Signature
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7.	N. Subrahmanyam , Sci 'C'	N. Subrahmanyam
8.	Munna Kumar Shah , Sci 'D'	Munna Shah
9.	A N Singh , Sci 'E'	AN
10.		
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14.		
15.		

Approval of Minutes by the Chairman-EAC

N Subrahmanyam

From: navin chandra <navinchandrarrl@yahoo.com>
Sent: Wednesday, July 17, 2019 2:35 PM
To: N Subrahmanyam; Dr S. Kerketta; Dr S. Kerketta; Dr S. Kerketta; N. Subrahmanyam; Dr S. Kerketta
Subject: Re: Corrections in the reports reg.

17/07/2019

Dear Dr. Kerketta Ji/Dr. Subrahmanyam Ji,

I have gone through the corrected Minutes of the 30th EAC meeting held on 12th July 2019. The Minutes are in order and can be uploaded on the web site of MoEFCC.

Regards,

yours sincerely,

(NAVIN CHANDRA)

Dr. Navin Chandra,
Chairman, Coal Mining & Thermal Power,
MoEF&CC, GOI, New Delhi.
Ex-Director General MPCST, Bhopal,
Ex-Vice Chancellor, SSSUTM, Sehore (MP)
(Retd.) Director (Actg.), CSIR-AMPRI, Bhopal
Member, RC, CSIR-AMPRI, Bhopal.
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navinchandrarrl@yahoo.com, navinchandraampri@gmail.com

AGENDA OF 30th MEETING (SPECIAL) OF THE RE-CONSTITUTED EXPERT APPRAISAL COMMITTEE ON THERMAL POWER PROJECTS

DATE : 12th July, 2019

TIME : 10.30 A.M. ONWARDS

VENUE : INDUS MEETING HALL, GROUND FLOOR, JAL WING, INDIRA PARYAVARAN BHAWAN, JORBAGH ROAD, NEW DELHI-110003.

ITEM	
Item No. 30.0	CONFIRMATION OF MINUTES OF 29th EAC (THERMAL) MEETING
Item No.	CONSIDERATION OF MATTERS
30.1	Review of Guidelines prepared by CPCB and CIMFR for Flyash disposal in low lying areas & abandoned mines and review of conditions and conditions prescribed in the Environmental Clearance of Thermal Power Projects in line with the Flyash Notification.
30.2	Review of need for Environmental Clearance for High Tension Power Transmission lines.
30.3	ANY OTHER ITEM WITH THE PERMISSION OF THE CHAIR.