



ODISHA POWER GENERATION CORPORATION LTD.

(A Government Company of the State of Odisha)

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Lr.No.ITPS.....8625...../WE

Date : 30.11.15

To

The Director (S)

Ministry of Environment Forests & Climate Change, Govt. of India

Eastern Regional Office,

A/3, Chandrasekharpur,

Bhubaneswar-751023.

Sub: Environmental Status Report of ITPS (2 x 210 MW), Banharpali, Dist: Jharsuguda for the period: April 2015 – October 2015

Ref: Environmental Clearance No. 14/13/83-EM-2, Dt. 27 Sept.1984

Sir,

Enclosed please find herewith the Environmental Status report of IB Thermal Power Station (2x210 MW), Banharpali, Dist: Jharsuguda for the period from April 2015 – October 2015 for kind perusal.

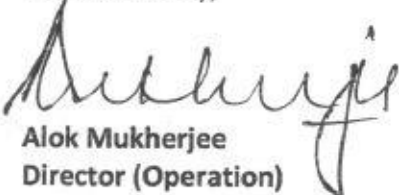
The soft copy of the report in PDF form has been sent through e- mail to mef@ori.nic.in.

Enclosures:

- i) Annex -I- Compliance status of Environmental Conditions
- ii) Annex -II- CREP Compliance Status.
- iii) Annex-III- Ash Utilization report
- iv) Annex-IV- Maximum and Minimum of monitoring reports.

Thanking you,

Yours sincerely,


Alok Mukherjee
Director (Operation)



ANNEXURE-I**ODISHA POWER GENERATION CORPORATION LTD
IB THERMAL POWER STATION (2X210MW)**

**Compliance Status of the Environmental Conditions, Ref: Clearance No. 14/13/83-EM-2, Dt. 27 Sept.1984.
Period – April 2015 – October 2015**

| Sl. No. | Environmental Conditions | Compliance Status |
|-----------|---|---|
| 1. | AIR POLLUTION | |
| a | A common stack height of not less than 200 mtr should be provided for two units of 210 MW. Similarly, for other two units a common chimney of 200-mtr height should be provided. This would help for better dispersion of pollutants. | <p>A bi flue common Stack of height 220 meters has been provided for U#1&2.</p> <p>Other two units i.e. Unit 3&4 of capacity 660MW each are under construction with twin flue common stack of height 275 meter.</p> |
| b | ESP of having operational efficiency of more than 99.7% should be provided. | <p>ESP of operational efficiency 99.82 %(design value) has been provided for existing Units.</p> <p>ESP internals both for Unit #1 & Unit #2 have been repaired during annual overhauling every year. Routine maintenance practice has been followed for ensuring healthiness of ESP to ensure the efficiency > 99.7%.</p> <p>ESPs retrofitting are under progress to achieve revised particulate emission norm, 100 mg/Nm3 by 31st March 2016 for both the Units as per the action plan submitted to State Pollution Control Board.</p> |
| c | Stack and ambient air monitoring should be taken up after the commissioning of the units and the data recorded. | <p>Stack monitoring has been taken up through online continuous emission monitoring system for parameters SPM, SO₂, NOx & CO for trend monitoring and taking corrective action so as to keep parameters within prescribed limit. Offline test is being conducted through grab sampling by calibrated portable Stack monitoring kit & Flue gas analyzer on weekly basis. These results are being recorded and reported.</p> <p>Six permanent ambient air-monitoring stations are installed by OPGC in & around ITPS out of which 03 no stations are placed in Industrial zone & 03 no in Residential zone. Ambient air monitoring has been done regularly for parameters PM₁₀, PM_{2.5}, SO₂, NOx & Noise.</p> <p>Four online ambient air monitoring station has been installed inside plant to monitor PM_{2.5}, PM₁₀, SO₂ & NOx. Real time data transmission to the OSPCB server from the air quality monitoring stations has been established. Two CEMS has also been connected to OSPCB server.</p> |

| | | |
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| | | Monitoring reports are being sent to SPCB, CPCB and CEA every month. Half yearly reports are being sent regularly to MoE&F, Govt. of India, Eastern Regional Office. Maximum, Minimum and Average Emission Data for the period April 2015 to October 2015 is enclosed as Annexure-IV . |
| 2. | WATER POLLUTION. | |
| a | Liquid effluents emanating from the different plants such as DM plant, Boiler blow down, Ash pond/ dyke, sewage etc. should be properly treated as per the standards stipulated by the State Pollution Control Board. | <p>The plant has been reusing its liquid effluents in its different process after necessary treatment since 28.06.2008. This is in compliance to SPCB's consent condition to reuse liquid effluents. The details of reuse processes are-</p> <ul style="list-style-type: none"> ▪ Domestic sewage of Plant has been discharged to soak pits after treatment in septic tanks. Domestic sewage of Colony and Hospital has been treated in STP and treated effluent is being reused for watering the Green Belt and Park at ITPS. ▪ No effluent from ash pond is discharged except seepage. Treated ash water is re-cycled 100% for reuse as make up water in wet ash handling system after necessary treatment. ▪ CW blow down effluent is being reused as makeup water in wet ash handling system. ▪ Boiler and Turbine effluents are being reused as ash handling make up after necessary treatment. ▪ D.M Plant regeneration effluent is being reused as Cooling System make up. <p>Around 99% of the liquid effluent being generated has been recycled and reused in side plant. Only the gravity sand filter back wash effluent and CT drift water has been discharged meeting effluent quality norm. Different avenues for recycling these two source of effluents has been explored but was not found feasible in the existing system. However the back wash water quality matches the drinking water grade in all respect except suspended matter. The water is settled in a zig-zag flow path & by the time the water reaches the final discharge point (about 500 m. away), it gets almost clear which has been confirmed from routine quality checks. Provision has been made for treatment and reuse of the gravity sand filter effluent in its expansion project (Unit#3 & 4) under construction stage.</p> <p>In abnormal or emergency situation if any liquid effluent discharge situation arises, the industry ensures the effluents are treated properly (neutralization, settling, natural cooling and oil removal) and prescribed standard is met before discharged.</p> |

| | | |
|---|---|--|
| b | Hot water coming from the condenser should be properly cooled so as to ensure to keep the temperature of the receiving surface water as per the standard stipulated by the state Board. | Hot water coming from the condenser is being cooled through cooling towers & reused for condenser cooling in close loop. Cooling Water blow down is being reused as make up water in ash slurry discharge system. |
| 3 | SOLID WASTE MANAGEMENT. | |
| a | Fly ash and bottom ash should be collected in the ash dykes/ponds. The supernatant water coming out of the ash dyke should meet the standards as prescribed by the State Pollution Control Board. | <p>Part of fly ash is collected from Storage Silo in dry form for ash utilization in manufacturing of ash bricks/ blocks, cement, road embankment preparation and in land reclamation. Balance quantity of fly ash is collected regularly in Ash pond by wet disposal method. As an environmental friendly ash disposal means, OPGC adopted ash disposal in the form of ash mound making and land scaping. Wet ash from operating Ash Pond A disposed through wet disposal means has been transferred to Ash Pond B for dry ash mound making. The ash mounds are capped with soil and grass turfed on entire ash surface after compaction. Apart from that ash is being used for Ash dyke height raising for Pond A. Required stability & safety study has been carried out by IIT, Madras. Regulatory requirements are also being fulfilled for the same.</p> <p>From ash pond no effluent is discharged out side except the seepage water. Treated ash water after control of turbidity is being re-cycled 100% for reuse as make up water in wet ash handling system.</p> |
| b | Green belt should be provided on the ash disposal areas filled by fly ash to check the dispersion of fly ash in the environment. | <p>Grass & weeds grow naturally on the ash disposal area i.e. on the ash mound & grass turfing has been maintained on the bund slope for prevention of ash dispersion & to provide additional strength to the bund by minimizing erosion.</p> <p>Dust suppression is being done by water spraying, soil capping & filling the ash pond by discharging ash water at multiple discharge points by garland discharge method to prevent ash dispersion. HDPE pipe has been laid from the ash water recycling pump house to the ash pond for water sprinkling purpose to avoid ash blowing.</p> <p>Tree plantation on the slope of the dyke has been restricted by State Pollution Control Board due to the risk involved to the dyke in form of tree root channeling effect.</p> |
| c | Trees plantation work should be taken up all around the Thermal Power Plant. The species to be planted may be decided in consultation with the Forest Department. | Adequate number of trees of different species has been planted at ITPS. Approximately 34% of the plant area is covered with Green belt and high density trees. Plantation activity is also being taken up every year. Detail plantation status is enclosed-Annex-V. |


Director (Operation), OPGC

ANNEXURE-II

ODISHA POWER GENERATION CORPORATION LTD IB THERMAL POWER STATION (2X210MW) COMPLIANCE STATUS OF CREP GUIDELINES Period: April 2015 – October 2015

| Sl. No | CREP Guidelines | Compliance Status/ Steps initiated |
|--------|--|--|
| 1 | Implementation of Environmental standards (emission & effluent) in non-compliant power plants | Not applicable being compliant plant. |
| 2 | For existing thermal power plants, a feasibility study shall be carried out by CEA to examine possibility to reduce the particulate matter emissions to 100mg/Nm3. | No such feasibility study report or guideline so far received from CEA. However, as per stipulation by State Control Board, Odisha, ESPs retrofitting job has been taken up to achieve revised particulate emission norm, 100 mg/Nm3 by 31 st March 2016 for both the Units. |
| 3 | New /expansion power projects to be accorded environmental clearance on or after 1.4.2003 shall meet the limit of 100 mg/Nm3 for particulate matter | Not applicable to existing Units as environmental clearance accorded for this plant in the year 1984. However, as per stipulation by State Control Board, Odisha, ESPs retrofitting job has been taken up to achieve revised particulate emission norm, 100 mg/Nm3. The condition with particulate matter limit 50mg/Nm3 is incorporated in the expansion units (2X660 MW) under construction. |
| 4 | Development of SO2 and NOx emission standards for coal based plants by Dec.2003 | No such standard for SO2 and NOx is developed so far. |
| | - New/expansion power projects shall meet the limit w.e.f 1.1.2005 | Not applicable at present. |
| | - Existing power plants shall meet the limit w.e.f. 1.1.2006 | Not applicable at present. |
| 5 | Install/activate opacity meters/continuous monitoring systems in all the units by December 31, 2004 with proper calibration system | Continuous emission monitoring systems has been installed since June, 2005. Calibration is done by comparing offline test results tested through calibrated Stack Monitoring Kit. |
| 6 | Development of guidelines/standards for mercury and other toxic heavy metal emissions by December 2003 | No such standard/guidelines for mercury and other toxic parameters is developed so far. |
| 7 | Review of stack height requirement and guidelines for power plants based on micro meteorological data by June 2003 | Compliance by other agency/ authority. However, the stack height requirement i.e 220 meter is fulfilled. |
| 8 | Implementation of use of beneficiated coal as per GOI Notification | The matter has been taken to Coal Supplier, Mahanadi Coal Fields Ltd for supply of washed coal |
| 9 | Power plants will indicate their requirement of abandoned coal mines for ash disposal & Coal India/MOC shall provide the list of abandoned mines by June 2003 to CEA | On continuous pursuance from OPGC and with the support of MoEF, Regional Office, Mahanadi Coal Fields Ltd(MCL) had given clearance in the month of May 2007 for back filling of OPGC ash in Lilarī OCM void from July 2009. Based on that permission, OPGC had taken immediate step for EIA and feasibility study |

| | | |
|----|---|--|
| | | engaging CIMFR, Dhanbad. But in the month of February 2008, the permission was withdrawn unilaterally by MCL on the ground that the anticipated life of Lilari Mine is extended for ten more years. Since then, OPGC has been perusing time and again to MCL to provide any other Mine void near OPGC site. In a high level meeting with MCL on 9 th February 2011, MCL has agreed to give in principle clearance to OPGC for back filling in Belpahar OCM. This has not happened so far. OPGC seeks support from MoE&F in this regard. |
| 10 | Power Plant will provide dry ash to the users out side the premises on uninterrupted access to the users within 06 months. | Dry fly ash is being provided to the interested users. Availability of adequate quantity dry ash has been ensured to meet the users demand. OPGC has made 1200 MT/Day dry ash collection facility which is about 40% of its total ash generation quantity. |
| 11 | Power Plant should provide dry fly ash free of cost to the users. | Complied. It is being provided free of cost. |
| 12 | State P.W.Ds/ Construction and Development agency shall also adhere to the specification/ schedules of C.P.W.D. for ash/ ash based products utilization. | Compliance by other agency/ authority. |
| 13 | (i) New plant to be accorded Environmental clearance on or after 1.4.2003 shall adopt dry fly ash extraction or dry disposal system or medium (35 to 40%) ash concentration slurry disposal system or Lean phase with 100% ash water re-circulation system depending up on site specific environmental situation. | The requirement is incorporated in the design for its expansion project (Unit 3 & 4) under construction stage. 100 % dry fly ash extraction system and High Concentration Slurry Disposal system with 100% ash water recirculation is envisaged. |
| | (ii) Existing plant shall adopt any of the systems mentioned in 13(i) by December 2004. | Complied. 40% dry ash collection facility has been adopted. 100% ash water is being re circulated for reuse in ash handling. |
| 14 | Fly ash Mission shall prepare guide lines/ manuals for fly ash utilization by March 2004. | Compliance by other agency/ authority. |
| 15 | New plant shall promote adoption of clean coal and clean power generation technologies | Condition has been considered for expansion project in shape of Supercritical technology for its expansion project under construction stage. |


Director (Operation), OPGC

ANEXURE-III

ODISHA POWER GENERATION CORPORATION LTD IB THERMAL POWER STATION (2x210MW)

| ASH GENERATION & UTILIZATION STATUS AT ITPS | | | | | | | |
|--|---------------------------------------|---------------------|------------|--------------------------------|----------------------------|------------------------|----------------------|
| Period: – April 2015 – October 2015 | | | | | | | |
| Ash Generation in M.T | ASH UTILIZATION in M.T | | | | | | |
| | Captive (Ash bricks, blocks) | Land reclamation | Cenosphere | Outside Ash Brick Plants | NH/SH Road construction | Ash Dyke raising | Total Utilization |
| 680686 | 1599 | 3586 | 45 | 4674 | 630 | 72960 | 83496 |
| % Utilization- 12.3 | | | | | | | |

Initiatives being undertaken for promoting and facilitating ash utilization:

- Installed dry ash storage and handling system as a part of modification, which was not there in original design. This job has been carried out long time ago.
- The available dry ash collection and storage facilities are adequate enough to cater to ash off-takers' as well as its internal demands.
- Free and timely availability of dry ash of different grades has been ensured since the year 2003-2004.
- A separate Ash Utilization Cell has been constituted headed by a Senior Officer at GM level to look after ash utilization
- The captive Ash Brick Plant was established in the year 2000. Since then clay brick use has been banned for all OPGC Plant as well as periphery development constructional activities.
- Utilizing ash in OPGC's own low lands for reclamation since the year 2004.
- Utilizing ash in OPGC's Ash Pond Dyke raising works since the plant commissioning.
- OPGC had made a long term (09 years) agreement with Ultratech Cement Ltd, Jharsuguda for off taking of 500 MT OPGC Ash/ Day, which was about 12% of OPGC's every day ash generation in the year 2003-04. Their ash offtake remained on an average of 06% from the year 2003 to 2010.
- Proactively OPGC made MOMs for ash off taking with Cement Plants (Aso Cement and Grasim Cement) proposed to be established in the District of Sundargarh.
- OPGC conducted meetings and pursued NH and SH authorities for use of OPGC ash in NH 200 and SH 10 road expansion from the year 2009 onwards.
- OPGC is constructing a two kilometers long village road utilizing ash.
- Experimental kitchen garden demonstration project was developed on Ash Pond.
- OPGC conducted several district and block level meetings, seminars, workshops etc. inviting ash brick plant owners, NGOs, Govt. departments to develop awareness level on ash utilization.
- OPGC Conducted series of Ash Utilization Street Play in the local villages, markets and gatherings to develop awareness level on benefits on use of ash bricks. Yearly thirty street plays were conducted for consecutive three years from the year 2009.

- OPGC has taken up R&D projects in Sambalpur University with technical support from District Agriculture Department for promoting ash utilization in agriculture.
- OPGC had made communications with Ash Exporters, Invited Ash Exporters (Ash Tech, Tanveer Enterprisers) to site for feasibility study on Ash Export.
- OPGC has sought support from Fly Ash Mission, IMMT, FAU, CFIRM, FARC, CIMFR etc. at different time for various issues related to Ash Utilization.
- OPGC has been putting best possible efforts to get an allotment of Mine Void since the year 2000 but, has not been succeeded because of the reasons mentioned below.

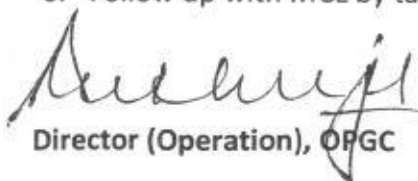
Reasons for not meeting the Ash Utilization Target:

1. Plant is located in a rural area in which the ash brick acceptance level remains low. Moreover, it is a minor utilization area. With best utilization opportunity, utilization in this particular area cannot exceed more than 2 to 3%.
2. Because of the above reason, big stone quarry or low lands are not available in the locality.
3. Export of Ash is not feasible since the site is located at a distance of 500 KM from the nearest Port. Transportation from site to nearest port through rail or any other means is highly expensive.
4. No major NH construction activity is going on near to the site. Major road construction activities are taking place near Jharsuguda. The demand from these activities are met by other thermal power plants very close to that road construction area. With very strong follow up, the construction agency lifted close to 2000MT from OPGC and then they stopped taking.
5. No scope available in major ash utilization area i.e Cement Plant Use. Unfortunately, even though we had agreement with Ultratech Cement, they stopped off taking from OPGC and started off taking from their sister concern Hindalco, Hirakud from the year 2011 onwards. The proposed Cements Plants at Sundergarh (Aso Cement Ltd & Grasim Cement) did not come up.
6. Considering OPGC Plant's location (Pit Head), mine void back filling of ash is the only means of utilization by which OPGC can achieve 100% ash utilization. The steps so far taken by OPGC since the year 2000 for mine void allotment is stated below. The matter has been time and again represented before MoEF, SPCB, Govt of Odisha but the matter still remains unaddressed at MCL end.
 - i. There was progress on mine void allotment in the year 2006. With the support from Regional Office, MoEF and SPCB, MCL had consented to allot Lilari mine void to OPGC. Subsequently, in July 2007, MCL accorded consent for taking up EIA & Feasibility Study for back filling in the void based on which OPGC engaged CIMFR to conduct the studies in October 2007. During the course of the EIA Study, the consent given to OPGC was withdrawn by MCL unilaterally vide their letter no MCL-3185/13.02.2008 stating "the life of Lilari Mine is extended with ten more years". Thereafter, OPGC has been pursuing MCL time and again involving regulatory as well as Govt. to reconsider the withdrawal or consider allotting any other mine void near to OPGC site but there has been no progress.

- ii. State Pollution Control Board, Odisha made a proceeding on 05.06.10 for backfilling of OPGC ash in BOCM Mine void of MCL as an alternate solution against allotment of Lilari Mine Void but no initiative has been taken so far from MCL side.
- iii. MCL has also been requested and pursued repeatedly by OPGC Chairman & Principal Secretary, Energy, Govt of Odisha, Managing Director and Director (Operation) but no positive response has so far been received from MCL.
- iv. In a meeting held on 24.1.2011 with Principal Secretary Energy, Govt. of Odisha, CMD MCL has given consent to give in principle approval for back filling BOCM mine void but the same has not been done, so far.
- v. In response to the letter of Director (Operation), OPGC, dtd 24.08.2013 on the subject, Director (Tech, P&P), MCL negated the request on the ground of BOCM expansion towards dip slide and no scope to back fill ash in running mine even though OPGC proposed for a partition bund to separate the void space from active mine for ash back filling.
- vi. In a high level meeting held on 13.12. 2013 under the Chairmanship of Chief Secretary, Govt. of Odisha, the proceeding made for allotment of BOCM mine void to OPGC was communicated to MCL on 03.04.2014 by Dept. of Environment & Forest, Govt. of Odisha for taking expeditious step on this but, there has not been any progress, as yet. MCL remained silent with no reply.

At this stage, OPGC fully commits to explore now all possible means of ash utilization for enhancing ash utilization in the current as well as in coming years. Our recent initiatives being taken on highest priority are mentioned below.

1. As per the directives of OPGC Board, an Ash Utilization task force has been constituted for exploring various options and work towards enhancing ash utilization.
2. In the process of identifying outside Stone/ Murrum queries and Low Lands by taking support from District Administration and taking ash filling action on priority for reclamation.
3. Identifying all opportunities in utilizing ash in road making both internal and external.
4. Encouraging local ash brick plants for maximum ash off take
5. Engaging Ash Utilization Service Providers/ Facilitators (Ash Tech, CFARM etc.) for finding other utilization source like Ash Export, Ready-mix Concrete etc.
6. Follow up with MCL by taking support from Govt. for mine void allotment.


Director (Operation), OPGC

| ANNEXURE-IV | | | | | | | | |
|---|------|------------------------|--------|------|---------------|----------------|----------------|------|
| ODISHA POWER GENERATION CORPORATION LTD | | | | | | | | |
| IB THERMAL POWER STATION | | | | | | | | |
| ENVIRONMENTAL MONITORING REPORTS | | | | | | | | |
| Period- April 2015 to October 2015 | | | | | | | | |
| STACK EMISSION | | | | | | | | |
| PARAMETER | NORM | STACK 1 | | | NORM | STACK 2 | | |
| | | MAX. | MIN. | AVE. | | MAX. | MIN. | AVE. |
| SPM (mg/Nm ³) | 100 | 146 | 130 | 135 | 100 | 145 | 125 | 128 |
| SOx (PPM) | NA | 542 | 485 | 510 | NA | 545 | 472 | 490 |
| NOx (PPM) | NA | 208 | 127 | 170 | NA | 205 | 122 | 165 |
| AMBIENT AIR QUALITY | | | | | AMBIENT NOISE | | | |
| PARAMETER | NORM | MAX. | MIN. | AVE. | Location | Noise in dB(A) | Noise in dB(A) | |
| PM ₁₀ (ug/m ³) | 100 | 87 | 55 | 70 | STANDARD | 75 | 70 | |
| PM _{2.5} (ug/m ³) | 60 | 37 | 22 | 30 | INDUSTRIAL | Day Time | Night | |
| SO ₂ (ug/m ³) | 80 | 15 | 8 | 10 | Min | 59 | 55 | |
| NO ₂ (ug/m ³) | 80 | 31 | 15 | 22 | Max | 72 | 65 | |
| LIQUID EFFLUENT QUALITY | | | | | Avg | 63 | 58 | |
| | UNIT | STANDARD | RESULT | | RESIDENTIAL | Day Time | Night | |
| Date | | | MAX. | MIN. | STANDARD | 55 | 45 | |
| Temp (In) | °C | T(O) - T(I) = <5 °C | 22.5 | 24.7 | Min | 42 | 35 | |
| Temp (Out) | | | 24.5 | 28 | Max | 53 | 41 | |
| pH at 25 oC | NA | 5.5-9.0 | 7.43 | 7.15 | Avg | 45 | 38 | |
| Chloride as Cl | PPM | 1000max | 35.5 | 26.3 | | | | |
| D. Phos as P | PPM | 5.0 max | 0.41 | 0.33 | | | | |
| O & G | PPM | 10.0 max | 1.05 | 0.66 | | | | |
| TSS | PPM | 100 max | 13.8 | 11 | | | | |
| TDS | PPM | 2100 max | 253 | 195 | | | | |
| Res Chlorine | PPM | 1.0 max | nil | nil | | | | |
| BOD | PPM | 30 max | 3.5 | 3 | | | | |
| COD | PPM | 250 max | 32.5 | 28 | | | | |

Note: As per Environmental Clearance condition vide letter dt. 27.09.1984, the stack emission norm was stipulated as 150 mg/ Nm³. In the year 2013, during renewal of consent, OSPCB stipulated the emission norm, 100 mg/ Nm³. Accordingly, OPGC started implementing the ESP retrofitting project with parallel path addition through BHEL and the work is at advanced stage of completion. Unit#1 ESP retrofitting is completed and taken into service. Its commissioning and PG test is planned before March 2016 after resolving the remaining technical problem with the existing ESPs. Unit#2 parallel path ESP erection job is in advanced stage of completion, is expected to be completed by 31st March 2016. Hence as per action plan submitted before OSPCB, the entire retrofitting job will be completed by 31st March 2016 to achieve the revised emission norm. It may kindly be noted that our units are quite old and the retrofitting work is voluminous, high budget oriented and involved with long unit shutdown, hence the retrofitting job takes considerable time.


Head (EHS) U.K. Bala