Sub: Fly Ash Disposal Policy

1. Background:

1.1 Need for Fly ash management:

In coal-fired thermal plants, the coal used to burn to generate electricity is sourced from mines located in India and abroad. The ash percentage in domestic coal is as high as about 34-47%, leading to generation of substantial quantity of ash as a by-product. Ash is generated in two forms, viz., fly ash and bottom ash. Of the ash generated, fly ash constitutes about 68 to 72% with the remaining quantity of about 28 to 32% being bottom ash, which is coarse in nature and having lesser utility. This is being pumped to ash ponds in wet form. The handling, evacuation and disposal of ash is a major concern in thermal power stations and also impacting the quantum of power generation. Thermal plants have a responsibility of disposal of ash in an environmental compliance norms laid down in PCB/ MOEF notification.

Considering the various kinds of problems posed due to the generation of ash and the hazards involved, the Government of India in the Ministry of Environment and Forests have issued the following Notifications to be implemented by the thermal plants/various user departments in the country:

(i) MOEF Notification No.S.O.763 E dated 14.09.1999
(ii) MOEF Notification No.S.O.3804 E dated 03.11.2009
(iii) MOEF Notification No.S.O.254 E dated 25.01.2016

Pursuant to the above and the observations of the Board, several initiatives were taken to sensitize the potential users and entrepreneurs by organising workshops in Tumkur, Ballari & Raichur in association with CEDOK, GoK during 2016-17.

1.2 Current level of fly ash generation and disposal in MT

<table>
<thead>
<tr>
<th>RTPS</th>
<th>2018-19</th>
<th>2017-18</th>
<th>2016-17</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total ash generated (Fly Ash + Bottom Ash)</td>
<td>2216112</td>
<td>2401181</td>
<td>2625848</td>
</tr>
<tr>
<td>Fly ash Available for lifting</td>
<td>1595601</td>
<td>1728850</td>
<td>1890611</td>
</tr>
<tr>
<td>Fly Ash Lifted</td>
<td>1219034</td>
<td>1296116</td>
<td>1382780</td>
</tr>
<tr>
<td>Unlifted Fly Ash sent to pond</td>
<td>376566</td>
<td>432735</td>
<td>507831</td>
</tr>
<tr>
<td>Bottom Ash sent to pond</td>
<td>443222</td>
<td>480236</td>
<td>525170</td>
</tr>
<tr>
<td>Pond Ash lifted</td>
<td>335487</td>
<td>77097</td>
<td>105390</td>
</tr>
<tr>
<td>Total (Fly Ash + Pond Ash) lifted</td>
<td>1554521</td>
<td>1373212</td>
<td>1488170</td>
</tr>
</tbody>
</table>

KPCL Ash Policy - 9.7.2019
<table>
<thead>
<tr>
<th>Fly ash utilization (%)</th>
<th>76.40</th>
<th>74.97</th>
<th>73.14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ash utilization (%)</td>
<td>70.15</td>
<td>57.19</td>
<td>56.67</td>
</tr>
</tbody>
</table>

### BTPS

<table>
<thead>
<tr>
<th>Particulars</th>
<th>2018-19</th>
<th>2017-18</th>
<th>2016-17</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total ash generated (Fly Ash + Bottom Ash)</td>
<td>996587</td>
<td>889059</td>
<td>1420657</td>
</tr>
<tr>
<td>Fly ash Available for lifting</td>
<td>689029</td>
<td>616414</td>
<td>1013292</td>
</tr>
<tr>
<td>Fly Ash Lifted</td>
<td>459906</td>
<td>365246</td>
<td>524721</td>
</tr>
<tr>
<td>Unlifted Fly Ash sent to pond</td>
<td>229123</td>
<td>251168</td>
<td>488572</td>
</tr>
<tr>
<td>Bottom Ash sent to pond</td>
<td>199317</td>
<td>177812</td>
<td>284131</td>
</tr>
<tr>
<td>Pond Ash Lifted</td>
<td>273013</td>
<td>80402</td>
<td>110369</td>
</tr>
<tr>
<td>Total (Fly Ash + Pond Ash) lifted</td>
<td>732919</td>
<td>445648</td>
<td>635090</td>
</tr>
<tr>
<td>Fly Ash utilization (%)</td>
<td>66.75</td>
<td>59.25</td>
<td>51.78</td>
</tr>
<tr>
<td>Ash utilization (%)</td>
<td>73.54</td>
<td>50.13</td>
<td>44.70</td>
</tr>
</tbody>
</table>

### 1.3 National Scene:

CEA in its report on fly ash utilisation among the utilities in the country for 2017-18 has indicated the following position regarding ash disposal:

**State wise Fly ash generation and its utilization during the year 2017-18**

<table>
<thead>
<tr>
<th>Sl No.</th>
<th>Name of State</th>
<th>Nos. of TPS</th>
<th>Installed Capacity (MW)</th>
<th>Fly Ash Generation (Million tonne)</th>
<th>Fly Ash Utilization (Million tonne)</th>
<th>Percentage Utilization</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Andhra Pradesh</td>
<td>9</td>
<td>12270.00</td>
<td>16.1997</td>
<td>13.8517</td>
<td>85.51</td>
</tr>
<tr>
<td>2</td>
<td>Assam</td>
<td>1</td>
<td>250.00</td>
<td>0.2430</td>
<td>0.0110</td>
<td>4.53</td>
</tr>
<tr>
<td>3</td>
<td>Bihar</td>
<td>4</td>
<td>4770.00</td>
<td>7.3780</td>
<td>3.1566</td>
<td>42.78</td>
</tr>
<tr>
<td>4</td>
<td>Chhatisgarh</td>
<td>22</td>
<td>19822.00</td>
<td>27.6227</td>
<td>14.8064</td>
<td>53.60</td>
</tr>
<tr>
<td>5</td>
<td>Delhi</td>
<td>2</td>
<td>840.00</td>
<td>0.3280</td>
<td>0.6750</td>
<td>205.79*</td>
</tr>
<tr>
<td>6</td>
<td>Gujarat</td>
<td>10</td>
<td>13792.00</td>
<td>3.1410</td>
<td>3.0043</td>
<td>95.65</td>
</tr>
<tr>
<td>7</td>
<td>Haryana</td>
<td>5</td>
<td>5540.00</td>
<td>6.1181</td>
<td>6.0832</td>
<td>99.43</td>
</tr>
<tr>
<td>8</td>
<td>Jharkhand</td>
<td>7</td>
<td>4812.50</td>
<td>6.5079</td>
<td>6.3204</td>
<td>97.12</td>
</tr>
<tr>
<td>9</td>
<td>Karnataka</td>
<td>6</td>
<td>8680.00</td>
<td>4.3356</td>
<td>2.4189</td>
<td>55.79</td>
</tr>
<tr>
<td>10</td>
<td>Madhya Pradesh</td>
<td>10</td>
<td>16420.00</td>
<td>20.4520</td>
<td>8.5136</td>
<td>41.63</td>
</tr>
<tr>
<td>11</td>
<td>Maharashtra</td>
<td>20</td>
<td>23156.00</td>
<td>20.8906</td>
<td>14.2159</td>
<td>68.05</td>
</tr>
<tr>
<td>12</td>
<td>Odisha</td>
<td>6</td>
<td>6388.00</td>
<td>13.1940</td>
<td>8.7370</td>
<td>66.22</td>
</tr>
<tr>
<td>13</td>
<td>Punjab</td>
<td>5</td>
<td>6020.00</td>
<td>4.8252</td>
<td>4.9311</td>
<td>102.19*</td>
</tr>
<tr>
<td>14</td>
<td>Rajasthan</td>
<td>6</td>
<td>5285.00</td>
<td>6.3430</td>
<td>6.6564</td>
<td>104.94*</td>
</tr>
<tr>
<td>15</td>
<td>Tamilnadu</td>
<td>14</td>
<td>12460.00</td>
<td>10.4287</td>
<td>6.9949</td>
<td>67.07</td>
</tr>
<tr>
<td>16</td>
<td>Telangana</td>
<td>6</td>
<td>2882.50</td>
<td>5.6021</td>
<td>2.5357</td>
<td>45.26</td>
</tr>
<tr>
<td>17</td>
<td>Uttar Pradesh</td>
<td>18</td>
<td>19570.00</td>
<td>25.2500</td>
<td>13.8415</td>
<td>54.82</td>
</tr>
<tr>
<td>18</td>
<td>West Bengal</td>
<td>16</td>
<td>14112.00</td>
<td>17.5814</td>
<td>15.127</td>
<td>85.96</td>
</tr>
</tbody>
</table>

**Grand Total** | 167 | 177070.00 | 196.4410 | 131.8663 | 67.13

* includes issue from pond stock

KPCL Ash Policy - 9.7.2019
It is observed that Karnataka has achieved only 55% utilisation while several other state utilities have achieved 85% to 100% utilisation.

1.4 Current system of flyash management

1.4.1 Wet & dry ash disposal: The Ash handling plant consists of

I) Bottom ash system
II) Coarse ash system
III) Fly ash system: (a) dry system; (b) wet system

- **Bottom Ash evacuation & disposal system** - Bottom ash gets collected continuously in water impounded bottom ash hopper. Bottom ash collected in hopper will be removed periodically by passing through clinker grinder so as to crush the clinker suitable for transport/handle. Slurry (mixture of ash and water) from clinker grinder will be conveyed to ash slurry sump by pumping and from there the slurry is pumped to ash pond.

- **Coarse Ash evacuation system** - Coarse ash will be collected in economizer hoppers and Air Pre-heater hoppers. This coarse ash collected in Eco & Air Preheater hopper is evacuated in wet mode.

- Fly Ash evacuation & disposal system - Fly ash collected in ESP Hoppers is evacuated automatically and sequentially from the hopper to collection tank/buffer hoppers/Intermediate storage hoppers by means of vacuum pumps.

The fly ash collected is normally transported to silos using air compressors. For any reasons, if fly ash cannot be evacuated in dry mode then wet mode is chosen and the slurry is pumped to ash bund.

- Silo unloading system:

The ash collected in different silos is unloaded into closed trucks/ Railway wagon through rotary feeder and retractable telescopic chute. Instrument air compressors, air receiver tank, regenerative type Air dryer, fluidizing air blowers with dedicated air heaters are provided in Silo area.

1.4.2 O&M of AHP Maintenance system-

Though the Ash Handling Systems have been established by KPCL, in 9/13 of its TPS units of RTPS, BTPS & YTPS, operation and maintenance of the AHPs is entrusted to the user agencies especially the cement companies or association of cement companies, who also have won the bid for the right to lift the entire ash generated in these units. In 4/13 units, operation and maintenance responsibility is with KPCL and ash only is lifted by Cement Companies at a competitively arrived at prices

1.5 Reasons for poor utilisation

1.5.1 Operational Issues

i) Frequent start and stop operations leads to problems of non-availability of bulkers for transporting the ash for almost 3-4 days once the unit is started as these bulkers have to be mobilized from elsewhere. Till then, there is no way of storing
the ash for more than 1 day of generation, hence ash is diverted to ash dyke instead of loading on to bulkers through ESP silos

ii) Labour Problems—Local labourers who are engaged by Cement Companies entrusted with O&M responsibility often create more problems by forming unions and demanding salaries and perks on par with govt. employees.

iii) Forced outages lead to supply & demand mismatch.

iv) Lack of demand from the Cement Company which signed the contract for lifting fly ash leads to diversion to ash pond though other users don’t get ash. This happens because of contractual & individual unit wise price variation.

v) Poor maintenance of AHPs by Cement Companies in order to cut cost often leads to hoppers getting filled up and thus getting diverted to ash dyke.

1.5.2 Contractual Issues:

i) Individual unit wise contracts have different terms & conditions especially in O&M responsibility and the price at which ash is lifted. The Price variation ranges from Rs.150/tonne to Rs.650/tonne from unit to unit. Though these prices were arrived at through tender, Cement Companies have signed contract, company lifting at higher price has always been having grievances and lifting less than the contracted quantity, seeking for revision of prices. This has resulted in poor utilization of fly ash to a large extent.

ii) Supply and Demand Mismatch: This happens due to various reasons like cyclic production levels in Cement Industry which is the basis for demand for fly ash and flexible operations of TPSs of late etc., have lead to severe problem of supply and demand mismatch for individual Cement Companies lifting fly ash unit wise. This problem gets aggravated with the fact that ash from particular unit of TPS has to be lifted by the same Cement Company irrespective of the lack of demand for fly ash from that company, while the one who needs ash may go without ash the terms & conditions and prices for each unit are same. This leads to poor utilisation though the demand is not fully met.

iii) Very High Penalty Rate: Penalty of 125% of price quoted for non-lifting is too severe and no Cement Company has paid penalties so far. All of them are seeking waiver of penalties as the penalty sums are higher than the cost they need to pay for the ash they lifted.

iv) Method of calculation of quantum of Non-lifted ash liable for penalty: KPCL has adopted a simple presumptive system of quantity not lifted for penalty calculation by multiplying the ash content with quantum of coal burnt, in spite of the fact bulk of the ash generated got diverted to ash dyke due to various technical and maintenance difficulties and was not available for lifting by the cement company. It's logical to punish if they don't lift when ash is made available for lifting but calculating penalty for not lifting when ash is diverted to pond and not available.
for lifting may not be acceptable. Even the ballooning penalties have driven away Cement Companies, thus leading to poor ash utilisation.

v) Non-Transferability of ash by users to other users or to sell to others: The present contract doesn’t allow the Cement Companies tied to a particular unit to transfer the ash to others when one doesn’t need but the other’s need it & vice versa. Also, sale of ash is not allowed, hence, the Cement Company has to compulsorily lift even if the ash is not needed at particular point of time, else liable to pay penalty. At the same time, when cement industry wants fly ash, it may or may not be available as unit may be shut for lack of demand for power but the cement company has to pay for O&M though ash is not available.

vi) O&M cost to be borne by the Cement Company irrespective of whether TPS is generating ash or not. O&M charges mainly of labour payment is unavoidable irrespective of operational status of a TPS, sometimes even for 3-6 months. This is a bigger penalty than penalty itself.

vii) Fly ash allocated to SSIs at free of cost causes heart burns among Cement Companies paying huge price for fly ash and O&M.

viii) Abuse (resale) of Fly Ash by SSIs to Cement Industries also results in poor utilisation.

1.5.3: Technical Issues:
The Boilers of the various generating units are designed based on design coal parameters with ash content of 28% to 40% as per coal to be supplied by WCL, MCL and SCCL under linkage. Accordingly, the sizing of the auxiliaries like AHP & its components especially vacuum pumps, ATCs, hopper mechanisms have been done in the past. Subsequently, on account of the quality of coal being supplied by collieries not conforming to the design parameters has resulted in the following problems:-

1) Hence, in certain units, the inadequacy of AHP & its components especially vacuum pumps, ATCs, hopper mechanisms leads to non utilisation up to 30-40%, thus resulting in poor utilisation & huge penalty, though it is not the fault of the cement companies.

2) Higher Ash content in coal leads to choking up of ESP hoppers, thus poking of hoppers becomes inevitable. This increases time required for ash evacuation & cost of operations, apart from poor utilisation & penalty.

3) Failure of Ash evacuation systems of economizer & Air preheater – the particle sizes are coarser than expected, hence ash is not getting evacuated, leading to choking up of systems, poor utilisation & penalty.
4) Uneven Gas flow Distribution in the ESP system leading to choking up of certain hoppers and no ash availability in certain hoppers, also lead to poor utilisation & penalty.

5) Unwillingness of the maintenance agencies to go in for spares from OEMs citing higher costs and preference for local makes which are less efficient.

1.5.4 Issues relating to Management of fly ash System by KPCL

From a period of very high generation leading to surplus ash problem to regulated generation with lower quantum of ash generation, consequential changes relating to fly ash disposal system not having been fully addressed by KPCL which has also lead to less than 100% fly ash utilisation. The following are the issues which need to be handled at the earliest:

i) liberal & subjective ash allotment system when thermal generation was high throughout the year.

ii) Scope for misuse of fly ash allocation free of cost to SSIs at a time when there is shortage of ash for cement companies due to lower generation, putting pressure on officers.

iii) Overdependence on user agencies for O&M activities supervision and lack of overriding supervision by KPCL to ensure 100% utilisation.

iv) Non resolution of the design & technical issues by suitable augmentation of capacity to offset the shortfall.

v) Need for stricter contract management by KPCL.

1.6 Consequences of poor utilisation

1) Less than 100% utilisation of fly ash for whatever reasons is a case of non-compliance with the environmental norms prescribed by MoEF.

2) Leads to possible loss of revenue.

3) Deposition of fly ash all over the plant premises leading to corrosion of various steel items of the TPS.

4) Instances of public protest, strikes & demonstrations against KPCL alleging fly ash deposition in the villages.

5) NGT has imposed Rs.5 crore penalty on each of the TPSs including KPCL TPSs which have not achieved 100% ash utilisation. Prolonged non compliance may attract severe action from NGT.

2. Objectives of New Fly Ash Disposal Policy

1) Achieving 100% fly ash utilisation including bottom ash.

KPCL Ash Policy - 9.7.2019
2) Recovering ash from ash dykes to the extent possible and empty the pond if possible
3) Avoid fly ash escaping into atmosphere and getting deposited in plant premises & in neighboring villages.
4) Maximise Revenue Generation
5) Ensuring end use of fly ash in safe manner as prescribed by MoEF.
6) Eliminate resale of fly ash by SSIs who lift at free of cost and sell to others resulting in SSIs profiteering doing nothing at the cost of KPCL.
7) Remove subjectivity in Ash Allocation system which is prone to malpractices and automate ash allocation system.
8) Create online fly ash market and spot market in future.
9) Streamline all contractual issues including penalty issues.
10) O&M to be taken over by KPCL as and when present contracts expire.
11) Eco-Friendly Operations to reduce air pollution and health hazards for employees as well as for villagers around the plant area.

3. Proposed Changes in Ash Disposal System

3.1.1 **Bottom Ash Disposal System Changes:** Bottom ash which is thought of as not having demand, happens to be so mainly because it costs more for recovery from Ash pond. Drying it adds to cost if lifted before it gets dried in Ash pond and recovery from pond after drying causes ash to escape into atmosphere and consumes lot of water also. Hence, following steps will be contemplated/attempted for better utilisation of Bottom Ash:

3.1.2 Certain portion of (upto 10-15%) bottom ash will be mandated to be lifted by Cement industries either from ash slurry sump or from ash dyke to make them eligible for dry fly ash. This is possible as the cement Industries are currently lifting pond ash which is a mixture of fly ash & bottom ash whenever fly ash is not available.

3.1.3 Similarly, SSIs getting allocation of fly ash shall be mandated to lift 30% the quantity from bottom ash so that bottom ash utilisation reaches 100%.

3.1.4 Modification of bottom ash disposal system will be attempted by recycling the bottom ash for combustion so that it gets converted to fly ash. There are systems available for the same elsewhere in the world which can eliminate need for ash pond and result in higher fly ash revenue apart from reducing pollution levels.

*KPCL Ash Policy - 9.7.2019*
3.1.5 Even if bottom ash can’t be sent for combustion, it can be pulverised and mixed with fly ash in silos so that it can be straight away lifted by Cement Companies instead of sending it to ash dyke.

3.1.6 In case bottom ash has to be sent to ash dyke, efforts will be made to create separate basins for bottom ash and fly ash being sent to ash dyke due to unavoidable reasons, which will to facilitate recovery of both bottom ash and fly ash separately and reduce cost & water consumption.

3.2 Ash Allocation System Changes:

3.2.1 Apart from bottom ash disposal through dry mode recycling or pulverization, efforts will be made to reduce diversion of fly ash from dry mode disposal to wet mode disposal to reduce quantum of ash getting into ash pond.

3.2.2 Diversion of fly ash from dry mode to wet mode disposal hitherto was not being monitored. Henceforth, hourly data on wet mode operation will be captured using I & C systems & data logger along with actual reason for diversion of ash to pond like maintenance issues, lack of demand or failure of any system etc. This data will be used for imposing penalty and recovering the entire cost from the O&M agencies.

3.2.3 The cement companies not lifting the ash from silos leading to diversion of ash to pond shall be reduced if not eliminated by bringing in changes in ash allocation system, contractual terms, penalty regime and automation of allocation processes.

3.2.4 Supply-Demand mismatch happening unit wise either because of stop start operations/ outages/no demand shall be handled by allowing allottees of ash from other units to lift ash from the units having ash in excess of demand from concerned allottee. This will reduce quantum of ash going to ash pond as well as reduce penalty burden on the allottee.

Many Cement Companies & SSIs who have not been allocated ash through competitive bidding but needing ash will be allotted ash through an online spot market being developed so that quantity unlikely to be lifted by regular allottee can be sold, thus ash will not go through wet mode.

3.2.5 In order to make sufficient ash available for the online spot market to develop & function effectively, excess ash generated due to higher ash content in coal which happens often, will be compulsorily be routed through on-line spot market.

3.2.6 Subjective daily ash allocation system for lifting would be eliminated by automating the ash allocation daily by computerized system without any manual
interface. A detailed Process Re-engineering Document has been prepared for the same which is attached as "annexure" to this policy document.

3.2.7 Daily ash allocation shall be strictly done through the software developed by K-ERP team of KPCL for the same purpose.

3.2.8 Ash allocation is made dynamic using data generated by the I&C system of AHP to capture the ash available for lifting everyday, end use by allottees and by monitoring the vehicle tracking system for vehicles carrying ash and track ash unloading at designated points. Any allottee not fulfilling these conditions or violating norms laid regarding end use will not be allotted ash from subsequent months to eliminate diversion of ash / resale of ash by allottees profiteering at the cost of KPCL.

3.2.9 If any allottee doesn’t lift the allotted ash, notices will be generated from software giving one month time for correction and if the allottee doesn’t improve lifting the allottee will get blacklisted and no allocation will be made in future.

3.2.10 Payment for ash and penalty system on billing by month end have resulted in huge arrears, especially the penalty has not been paid by any allottee so far, leading to audit objections also. Most of the allottees are disputing the penalty calculation method and seek waiver. Hence, a system of pre-paid ash allotment will be introduced shortly to avoid non-payment cases. Non-payment of penalties beyond 60 days will again result in stoppage of ash allocation.

3.2.11 Ash can be lifted by allottees only using the registered vehicles fitted with GPS devices enabling KPCL to get real time data on ash movement and unloading points.

3.2.12 Unloading points & routes will be geo-fenced to check whether any diversion/ resale is being done by allottee and any violation will result in stoppage of ash allocation and blacklisting.

3.2.13 Data on ash generation, lifting by allottees and diversion to ash dyke will all be captured electronically and monitored by EDs of TPS and by head office.

3.2.14 Ash Allocation free of cost to SSIs will be stopped henceforth to stop misuse/resale by SSIs and the same is enabled by revised guidelines of MoEF that those TPS which achieves 100% utilisation will be exempted from providing free of cost.

3.2.15 Unit wise ash allocation leading to temporary non-availability of ash for certain allottees and certain allottees not being able to lift shall be eliminated by pooling the allottees and ash available for allotment TPS wise and not unit wise as is being done. Later, the same will be pooled location wise i.e., Bellary and Raichur and eventually excess quantity will be pooled for the entire KPCL.

KPCL Ash Policy - 9.7.2019
3.3. Contract Management Changes:

3.3.1. Poor O & M by agencies and blame game between Cement Companies entrusted with O & M and KPCL have lead to poor utilization to large extent.

Hence, there is an immediate need to delink fly ash lifting from O & M of AHP as present contracts bundle both together. As none of the companies agreed with the suggestion of KPCL to hand over O&M to KPCL on the condition that they must absorb the O & M cost in addition to cost of ash. Delinking will be done as and when the present contracts in force expire, it is inevitable as most of them neglect maintenance to cut cost.

3.3.2. The O & M of the AHP which suffers a lot because the cement companies trying to cut cost on spare parts and maintenance, results in almost 30-40% of ash being pushed to ash dyke.

As per one of the Supreme Court orders, works of permanent nature can’t be outsourced and Labour Department has issued notice to discontinue the outsourcing. Hence, O & M of AHP will be taken over by KPCL.

3.3.3. Till O&M of AHP is taken over by KPCL, if allottees they neglect O & M and the same will be monitored by keeping watch on number of wet mode operation hours and the penalty will be imposed by calculating the penalty using discharge rate of wet mode pumps.

If penalty is not paid within 30 days of notice, penal rate of interest will be calculated and if not paid within 60 days, ash allotment will be stopped and contract will be terminated.

3.3.4. Lifting Ash from silos must reach 95% every month for each allottees, else penalty will be imposed for unlifted quantity. Failure to pay penalty will be dealt with as envisaged in para 3.3.3.

Ash available for allocation shall be pooled plant wise, location wise and for the whole of KPCL to ensure continuous availability of ash for all allottees but quantity may get reduced dynamically depending on the ash availability instead of some allottees going high and dry.

3.3.5. Absolute quantity assurance will be done away with and proportionate quantity allocation only will be adopted by allocating the ash considering the ash generation and allocation limit.

3.4 Technical / Design Changes:

3.4.1. Choking of ESP hoppers does happen often than the acceptable level. This may also be because of poor O&M practices by the operating agencies but it has
been established that design issues arising out of using coal supplied by the collieries not adhering to the design characteristics on the basis of which the plant sizing was made also lead to ash accumulation in hoppers.

3.4.2. Capacity Augmentation of vacuum pumps, Ash transport compressors and other associated Ash evacuation system will be taken up by KPCL and the cost would be borne by KPCL.

3.4.3. Fine tuning of flue gas path needs to be taken to avoid choking of hoppers.

3.4.4. The bulk density of fly ash at times is more than the bulk density considered for AHP system design, thus leading to hopper choking. This can be handled by re-designing the system for actual bulk density of fly ash noticed and KPCL will take it up at its own cost.

3.4.5. Ash content considered for design of the Boiler is around 28% to 40% but most of the times, ash content in coal crosses 40 to 42 %, thus leading to non-evacuation of fly ash. This again implies modifications that need to be considered in the system so that the ash hoppers don’t get choked up leading to hopper poking. System modification shall be taken up by KPCL to handle it at the earliest.

3.4.6. Presence of higher percentage of unburnt coal and coarse ash content also lead to hopper choking. System modifications like coal mill pulverization and combustion process monitoring would be necessary continuously to avoid the problem.

3.4.7. Design constraints and higher ash content can be effectively handled if the coarser ash content from economizer & APH are separated out and taken to dedicated silo. Required modification activities are being initiated by KPCL.

3.4.8. Choking up of ash transport pipelines also happens for the reasons stated above leading to ash getting into open drains and atmosphere. Above said modifications must eliminate this problem too.

3.4.9. Frequent stop & start operations leading to logistics problems in arranging bulkers by allottees (cement companies) affects ash lifting for 2-3 days after unit is lighted up, thus diversion to ash pond and poor utilisation happens. Also temporary demand supply mismatches result in the same scenario. Hence, there is a need for creating additional capacity for temporary storage of ash to the extent of ash being generated for one week if the plant runs at full capacity by enhancing the capacity of silos or by going in for additional silos so that ash can be utilised directly from silos instead of being pushed to pond.

KPCL Ash Policy - 9.7.2019
3.5 Ash Pond Management Changes:

Though we have huge stock of ash in the ash dykes, efforts will be made to eliminate or at least reduce the quantum of ash getting added to the ash dykes on daily basis by adopting all the changes proposed in the document. Our endeavour is to achieve 100% utilisation of both fly ash & bottom ash, yet bottom ash will keep coming to ash pond till disposal system of bottom ash is converted to dry mode and also diversion of fly ash is completely stopped. Hence, ash pond management will continue to be critical factor though 100% utilisation will be our target.

Thus, scientific management of ash pond to comply with environmental norms to avoid ash getting into water / natural drainage systems & atmosphere does assume significance. The following steps will be taken to ensure proper ash pond management.

3.5.1. Compartmentation of ash pond and sequencing of wet ash addition and dry ash recovery will be done in such a way that ash recovery / mining happens systematically and ash getting into atmosphere & drainage systems is reduced.

3.5.2. Continuous water impounding for the compartments where ash is getting added so that ash doesn’t escape into atmosphere.

3.5.3 Ash mining / recovery must happen from few compartments only at a time to reduce ash escaping to atmosphere.

3.5.4 The compartments undergoing decantation and drying of ash must have adequate moisture level during decantation to avoid ash escaping to atmosphere and complete vegetative cover or any other structural cover during the drying process shall be provided.

3.5.5 Efforts will be made to recover the ash through wet mode using slurry pumps if Cement Companies come forward to carry the pond ash with water content, so that ash doesn’t get into atmosphere and ash recovery is easy. This may be possible with minimal modification of portion of the ash pond either with HDPE flooring or concrete flooring and installation of slurry pumps. If this becomes feasible, 80% of ash pond area can be saved, water usage can come down, ash recovery cost will come down and fly ash will not escape to atmosphere at all. However, this attempt will succeed only if the Cement Companies are willing to lift pond ash with moisture content & dry it at their plant site.
3.5.6 Efforts will also be made to grow vegetation over the ash deposited in dykes area which are not used for ash deposition or recovery currently in order to avoid ash escaping to atmosphere.

3.5.7 Efforts also will be made to dry the pond ash using solar drier systems so that drying can happen quickly and the vapour can be condensed and the water recirculated. The turn around time of ash coming in wet mode and recovery of ash can be reduced substantially apart from recycling of water and avoiding ash escaping to atmosphere.

3.5.8 Attempts also will be made to adopt drying of pond ash in the ash dyke by adopting low cost glass house or poly house approach.

By adopting all the above steps, efforts will be made for 100% utilisation of both fly ash and bottom ash in the following order:

(i) 100% utilisation in dry mode

(ii) If not, attempt for 100% utilisation, partly in dry mode and partly in wet mode but without letting ash to the pond.

(iii) If it is not economical, then 100% utilisation through dry & wet mode with scientific and eco friendly ash pond management & conserving water.

4. Issue of Penalty

4.1 Till Now

The present contracts have exorbitant rate of penalty of 125% of the contracted rate for the unlifted quantity of fly ash. As on date, the penalty works out to Rs.131.574 crores as given in the table below:

<table>
<thead>
<tr>
<th>Unit</th>
<th>User</th>
<th>Period Up to</th>
<th>Unlifted qty in lakh MT</th>
<th>Penalty in Rs. Crores</th>
</tr>
</thead>
<tbody>
<tr>
<td>RTPS U1-6</td>
<td>ARV Cement Society</td>
<td>Mar 19</td>
<td>0.96</td>
<td>2.843</td>
</tr>
<tr>
<td>RTPS U7</td>
<td>Kalburgi Cement Pvt. Ltd.</td>
<td>Mar 19</td>
<td>3.63</td>
<td>13.279</td>
</tr>
<tr>
<td>BTPS U1</td>
<td>Rain Cement Ltd.</td>
<td>May 19</td>
<td>10.14</td>
<td>76.188</td>
</tr>
<tr>
<td>BTPS U2</td>
<td>UltraTech Cement Ltd.</td>
<td>May 19</td>
<td>11.92</td>
<td>39.264</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>26.65</td>
<td>131.574</td>
</tr>
</tbody>
</table>

In the several interactive meetings, the cement companies have expressed that the present contracts though focus on lifting of the allotted quantity of fly ash and excess if any in any quarter at the agreed rates which is subject to annual escalation, the higher costs of fly ash as well as penalty at 125 % of cost of ash are deterrent for ensuring 100% utilisation of fly ash. On the other hand, other GENCOS are charging lower rate per tonne and have a penalty regime of 10 to 25% for non-lifting and no penalty if 50% of the ash is lifted.

*KPCL Ash Policy - 9.7.2019*
Computation of penalty on the unlifted quantity of fly ash has also been disputed by Cement Companies on account of the following reasons:-

4.1.1 Quantification of fly ash - initially KPCL assumed 80% of the total ash generated would be captured in the form of dry fly ash. Later studies indicate that it could be in the region of 68% to 72%. APGENCO has assumed 71%. This is significant as the unlifted quantity considered for penalty calculation is derived by deducting the quantity of ash lifted from Total ash generated (assumed to be 80%).

4.1.2 Technical factors impacting the availability of fly ash and its evacuation into the silos. There are many difficulties in evacuating the dry fly ash into the silos and hence sent in wet mode, yet the penalty is imposed on the allottee.

4.1.3 The operation of the units are affected due to equipment breakdowns & shut down by LDC on NLD resulting in uncertainty in availability of fly ash and frequent start up operation using oil leading to contamination of fly ash which results in certain portion of fly ash unfit for Cement Industry usage, but the penalty gets assessed even for that quantity also.

4.1.4 The penalty is 125% & 50% of the contracted rate for the unlifted quantity in respect of RTPS, BTPS 1&2 and BTPS 3 & YTPS respectively. The contracted rate varies from user to user and increases every year by 5%.

4.1.5 The Allottees or user agencies (cement companies) have invested in the infrastructure and maintaining the ash handling systems incurring overheads irrespective of the ash production. Thus, they have to spend on O&M though they don’t get ash when units are in operation also and get penalized if their demand is less when plant runs, yet KPCL doesn’t allow for transfer of excess quantity to other users. If allowed, penalty can be avoided without breaching any conditions of the contract.

4.1.6 After signing of agreements with user Agencies (Allottees), number of thermal plants have come up in the vicinity and they are offering the same fly ash at a lesser cost without the burden of booting O&M cost; Also, the penalty regime is reasonable with penalty at 10% of the base rate levied on the unlifted quantity where the total annual quantity lifted is less than 50% and no Penalty if lifting is more than 50%.

4.2 Non-Payment of Penalty:
The penalty proposed/calculated for unlifted quantity till now works out to Rs.131.574 crores as given in the above table, which is about 39.48% of total revenue of Rs.333.24 crores None of the cement companies paid penalty amount and kept asking for reconciliation and waiver of penalties on the grounds on which they disputed penalty regime. Considering the huge amount being raised as penalty and recovering it forcefully might result in complete halting of lifting of fly ash by these companies, KPCL kept penalty collection pending. At the same time, no decision to reassess or revise the penalty rates mutually or fine-tuning of the calculation method was attempted by KPCL for the last 10 years.
This stalemate has been a major botheration for Cement Companies and in many cases it has been one of the reasons for non-lifting of fly ash & poor utilisation. On the other hand, non-recovery of penalty has been objected to by AG audit.

Hence, it is felt necessary to go in for reconciliation of penalty and to settle the issue once for all so that the cement companies can focus on 100% lifting of fly ash.

Onetime settlement proposed is being prepared by Chief Engineer (Fuels) in consultation with Project Heads of RTPS & BTPS to be placed before the Board for final decision. A decision on this long pending issue will have a positive influence on lifting of fly ash by Cement Companies.

4.3 Pricing of flyash and pond ash and levy of Penalty hereafter for existing and new allottees:

4.3.1 Pricing of ash shall be as under:-

(i) Existing cement agencies who have running contracts shall pay their respective contracted rate for lifting their allocation of fly ash and at Rs,75 per tonne of pond ash;

(ii) KPCL nominees shall pay at the agreed prevailing rate of the respective unit/s of the TPS for the fly ash lifted from such unit/s and at Rs,75 per tonne of pond ash;

(iii) All SSIs both existing and new ones shall pay Rs.200 per tonne of flyash and at Rs,75 per tonne of pond ash;

4.3.2 The price of fly ash and pond ash indicated in 4.3.1 above is applicable provided the users lift pond ash in addition to fly ash in the following proportion:

(i) Existing and new cement agencies:15% of contractual quantity of fly ash;

(ii) KPCL nominees and SSIs: 30% of the allotted quantity

4.3.3 Penalty for non-lifting of fly ash:

(i) Existing cement agencies both with and without O&M scope: Extent of unlifted quantity of dry fly ash and dry fly ash sent in wet mode for reasons attributed to the agency multiplied by 50% of the respective contracted rate. However, the penalty rate in respect of the period prior to the coming into force of this policy, will remain the same till one time settlement of pending arrears are settled, wherein the reasonable rate at which the penalty to be imposed will also be decided. Once the Board takes the decision, the said revised rate can be adopted for that period.

(ii) KPCL nominees and SSIs: Unlifted quantity multiplied by 50% of the their applicable price

KPCL Ash Policy - 9.7.2019
4.3.4 Penalty will be collected every month and the failure to pay penalty beyond 60 days, will result in stoppage of ash allocation and termination of entire contract beyond 90 days.

4.3.5 Stoppage of allocation and termination can pave way for reallocation of the cancelled quantity of ash to other user agencies

This policy shall come into immediate effect. CE (Fuels) shall notify all ash users and the policy shall be hosted on the website. The necessary guidelines to regulate the allocation and issue of ash within the framework of this policy shall also brought into force shortly and the thermal plants and all stakeholders shall adhere to these guidelines to ensure smooth disposal of ash to an extent of 100% to meet the MoEF stipulations.

cc: TD/FD
    All EDs/CEs/GMs

Managing Director

KPCL Ash Policy - 9.7.2019
Annexure to Memo No, A1 RI A (PS) dated 9.7.2019

Process Flow

Ash Handling in Thermal Power Plants

Fly Ash is a by-product in Thermal Power Plants which is environmentally hazardous if not handled or disposed off carefully. The ash generation in the thermal plants depends on the ash content of the coal as fuel in the Thermal Plants and the same is classified into two categories, namely Fly Ash and Bottom or Pond Ash. The Fly Ash flows through boiler through ESP and goes to the silos from where the Fly Ash is either loaded onto the closed containers called as bulkers and transported to cement and brick manufacturing units or pumped to the Ash Pond after mixing with water if there are no takers for Fly Ash or if there is a problem in the Ash Handling System.

Similarly, Bottom Ash which is comparatively coarser flows gets pumped into Ash Pond.

The Pollution Control Norms do stipulate that the 100% of the Fly Ash has to be either used for either cement manufacturing or for Brick Making or for any other permitted uses. The govt. has also stipulated that about 20% of the quantity of Fly Ash generated must be given free of cost to the Small Scale Industries (SSI units) and the rest can be sold off to cement plants or disposed off safely. Though there were not many takers for the Fly Ash in the past, the demand for Fly Ash has grown to such an extent that the demand exceeds the supply most of the times.

Fly Ash utilisation for one of the permitted uses is also in the best interests of the Thermal Power Plants as the disposal of Fly Ash other wise to the Ash Pond and management of Ash Pond are not only cumbersome, complaints ridden and costly affair but also violative of the pollution control norms.

The demand for Fly Ash exceeding the quantum of Fly Ash generated has resulted in the free allottees misusing it for reselling rather than using it for brick manufacturing and put pressure on officers of KPCL for allocation. Thus, there is a need to streamline the process of Ash Handling and disposal System and put in electronic handling and monitoring systems in place.

The Fly Ash being provided free of cost to the SSI units may be reconsidered as per the recent notification of MOEF, GoI, the Thermal Power Plants which are utilising or disposing off 100% of the Fly Ash need not provide the SSI units free of cost. This enables us to charge for the Fly Ash so that the allotted won’t be able to resort to resale at a throw away price. The cost of Fly Ash would be

KPCL Ash Policy - 9.7.2019
arrived at as half of the average price arrived at by KPCL in the sale of Fly Ash to Cement Manufacturing Units.

This apart, the Fly Ash can be mixed with Bottom Ash for brick making to the extent of 30-50% depending on the process adopted by the brick manufacturer. As the Bottom Ash does not have many takers, it is disposed off to the Ash Pond and it becomes burden for KPCL to maintain the Ash Pond as well as well as it adds to the cost. Hence, every industrialist picking up Fly Ash must be mandated to pick up minimum of 30% quantity of Bottom Ash for Brick Manufacturing, failing which the SSI units shall not be allotted Fly Ash.

These apart following conditions will be imposed so as to ensure end use and avoid any resale of Fly Ash by SSI units:

1. The allotment of Fly Ash is restricted only to the list of allotted approved by the Corporate Office.

2. No new addition to the approved list will be allowed unless the demand for Fly Ash by cement industries comes down below the quantum of Ash generated.

3. It is the responsibility of the allottee to prove that the Fly Ash picked up has been used for the permitted use only.

4. One time inspection of type of industry, the quantum of Fly Ash which will be used, the product produced, the mechanism put in place to unload and stock the Ash and the record keeping, etc will be inspected by the team and the list of eligible allottees will be revised based on these reports.

5. The eligible allottees will be allotted Fly Ash as per entitlement as well as availability.

6. The allottees must file reports and proof or evidence prescribed by KPCL for having utilised the Fly Ash allotted to them.

7. The allottees must apply for Fly Ash allotment every single time through an online system which will be introduced by KPCL.

8. The vehicles used for the Fly Ash Transportation must be registered with KPCL and no other vehicle will be allowed to carry the Fly Ash.

9. Every vehicle used for Fly Ash Transportation must have GPS tracking facility as prescribed by KPCL, failing which it will not be allowed to carry Fly Ash.

10. If a vehicle either does not have the GPS tracking facility or deviates from the route and destination permitted or does not provide photographic

KPCL Ash Policy - 9.7.2019
evidences for having unloaded the Fly Ash at the destination permitted, then, the allottee in whose name the Ash is allotted and the vehicle will be blacklisted and will not be eligible for allotment of Fly Ash anymore.

11. The allottee must have a prepaid account with KPCL for lifting Fly Ash, as and when he picks up the Fly Ash corresponding charges will be deducted from his account. He must keep minimum balance in the account to be eligible for the allotment.

12. Once the Fly Ash is picked up by the allottee, he must produce photographic evidence of unloading at his site as well as the products manufactured using the mobile app system designed by KPCL.

13. This apart all the allottees must register with GST irrespective of whether or not they are required to register with GST. Also, every month they must file GST returns and the copy of the same must be submitted to KPCL. If this is not complied with, the allottee will not get Fly Ash allotment.

14. Allottees must also provide the ESCOM service connection details to KPCL and KPCL will check the Power utilisation as an indication of operation of this unit and utilisation of Fly Ash.

15. Periodic and surprise inspections will be carried out by the inspection teams as prescribed by KPCL.

**Step by Step Process:**

1) Registration of Allottees in the online portal of the KPCL, the format shall be prescribed by CE(Fuels).

2) Validation of the allottees by KPCL or inspection team as one time inspection as well as periodic inspections as prescribed by CE(Fuels), KPCL or through online validations.

3) List of eligible allottees to be updated by the system periodically, at least once in a quarter.

4) The eligible allottees must make request for allotment of Fly Ash as and when they need, in the online system to be developed and made available by KPCL for this purpose.

5) Once, the requests are raised, the system shall either allot Fly Ash either at the quantity requested or as per availability quantity will be allocated. If the Ash is not available immediately, the request would be queued up and allotment will be made as and when Ash is available.

*KPCL Ash Policy - 9.7.2019*
6) Allotment of Fly Ash and Bottom Ash must be done in 70:30 ratio.
7) The system must check for the eligibility of the allottee before every allotment.

8) The eligibility shall be checked by the system from the periodic inspection reports filed by the inspection teams as and when they conduct inspections as well as the system shall check the following parameters from the data uploaded by the allottee as well as from various govtdept reports or databases.

9) Disqualification report by inspection team.

10) Power Utilisation data as pulled from ESCOM database and calculate whether the unit has utilised required power to manufacture the bricks.

11) Verification of GST return data by one of the KPCL official and authentication of the allottee, this is to be done once in a quarter.

12) Non- Violation of geo-fence or no route deviation by the vehicle which carried the previous lot of Fly Ash for the allottee in question from the GPS system by the allotment software itself.

13) Validation of photos uploaded by the allottee, once in a quarter.

14) Those allottees clearing the validations mentioned in the steps 9-13 only will be eligible for allotment of Ash during the month.

15) The allotment will be subject to the quantity of Ash Available.

16) If the Ash is available and the allotted is eligible, the system will allot the Ash and intimate the allottee to come and pick up the Ash. The intimation must be available in their login as well as SMS alert must go.

17) Once the allotment is made, the system should also send allotment order to the login of the allottee as well as to the CISF personnel posted at the gate and for the staff posted at the silos (AHP).

18) The allottee must be able to print out vehicle permit and the same must be cross checked in the system by the security personnel, no vehicle will be allowed to enter the premise without the vehicle permit.

19) The staff at the silos or Ash Handling points shall not provide Ash unless the allotment order and vehicle permit is cross checked in the system and the vehicle is getting tracked through the GPS system.

20) The driver of the vehicle shall upload a pic in the mobile app to be developed by KPCL which will capture the time and geo stamp.

KPCL Ash Policy - 9.7.2019
21) The route, Ash Transporting vehicle would take should have been captured in the system and geo-fencing must have been done.

22) Any deviation in the route will be alerted to the concerned officers and also it will be linked to the allottee validation system in the software so that any deviation will make the vehicle and the allottee ineligible for the allotment next time.

23) The driver shall capture a pic once the destination is reached and the Ash is being unloaded which will pick up time and geo stamp automatically.

24) If the destination is not an authorised destination or the driver fails to capture the pic in the mobile app, the system should make the allottee and the vehicle ineligible for further allotment.

25) Similar system of mobile app system for capturing the time and geo stamp must be followed for the Bottom Ash also as Bottom Ash will be picked up as part of Fly Ash allotment or independently for road construction or for any other use.

26) The allottee shall be required to file details of the quantum of the bricks produced and the ESCOM meter reading and upload the GST return copy before he can apply for next allotment. The system must keep track of this activity and shall permit him for raising Ash allotment request only if he has provided these details in the format provided in the online system.

***