एनटीपीसी
NTPC
A Maharatna Company

NTPC Limited

(A Govt. of India Enterprise)

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ASH POLICY 2015

M E S S A G E

India is one of the fastest growing economies having third largest coal reserves in the world, close to 300 billion tons. Hence coal is and will remain our main source for primary energy.

The high ash content in coal to the tune of 35-40% coupled with limited capacity of coal washeries at 131.24MMT poses grave challenge of utilizing millions of tons of ash generated. It is, therefore, important for NTPC to manage its inevitable byproduct i.e. ash, while planning to scale up its generation capacity so as to reach 128GW by 2032. Despite our various efforts, Ash Disposal/Utilization continues to remain key concern amongst all stakeholders.

NTPC being the trend setter, has come out with innovative ideas for meeting the challenge of Ash Utilization head-on by resorting to noble concepts in ash utilisation. One important area explored is that of mine filling. Such mines filled up with ash and other earth-toppings are capable of greenery and cultivation, which has been demonstrated by NTPC at its various eco-parks that have been developed on ash. Filled up leveled mines can be returned to its original owners or their descendents, thus removing the major cause of discontent as people feel deprived of their ancestral land at the time of land acquisition. This we believe might bring about revolutionary changes in the dreaded land acquisition process. Thus, reducing opportunity cost of land owners and creating win-win situation for all stake holders.

The **'Ash Policy – 2015'**, is a vision document, a green initiative, which provides the ash utilization issue in an integral way from generation to end product. It provides policy framework for ash utilization in the gamut off activities. This document we believe will go a long way and add vistas of opportunities in meeting Ash utilization and making our future cleaner & Greener.

DR. ARUP ROY CHOUDHURY
(Chairman & Managing Director)

F O R E W O R D

NTPC has produced about 57 million tons of Ash last year. Production of ash is inevitable in thermal power plants. Huge quantities of ash being produced by power plants will be an environmental hazard if not handled properly. At the same time, ash has huge potential for productive utilisation like manufacturing of PPC cement, ash bricks, light weight aggregate and artificial sand, and increasing productivity of agriculture land, in addition to back fill in mines, reclamation of low land areas, etc. These areas of ash utilisation can give huge revenue realisation, besides addressing the environmental problems associated with ash disposal.

Manufacturing of clay bricks is creating menace by causing depletion of topsoil and illicit cutting of trees. Moreover, it has been well established that ash bricks are not only stronger but also economical than clay bricks. Therefore manufacturing of ash bricks is the only solution to address this problem. By supplying quality ash bricks at cheaper rates and raising awareness in public about better properties of ash bricks, we can develop wide spread public acceptance for ash bricks.

NTPC, being the industry leader, has to pioneer the better practices for ash utilisation. As a green initiative, NTPC has to venture in a large scale into the production of ash based products.

Ash Policy 2015 aims at 100% utilisation of ash for productive usage along with fulfilling social and environmental obligations as a green initiative and attempting to realise its revenue potential.

I am sure that this policy will go a long way in protecting the nature by judicious ash utilization, and giving a better environment to the future generations.

March 10, 2015

M.R.P. Rao, IFS
(Chief Vigilance Officer)

M E S S A G E

In today's scenario, Ash management is a multi-facet subject. On one side arranging land for ash dyke and its subsequent maintenance based on stringent environmental norms is a big challenge. On the other side use of fly ash as a resource material, in various areas like manufacturing of cement, concrete and other building products, has emerged as a big commercial opportunity. As a result, Fly ash earlier considered to be “industrial waste” has now acquired the status of “useful and saleable commodity”.

NTPC (including its JV's) has an Installed coal based capacity of 37,904 MW. Further 22,685 MW and 9,810 MW coal based capacity is under construction and bidding stage respectively.

Effective and sustainable utilization of fly ash is the prime objective of NTPC. To introduce right momentum for fly ash utilization in large quantities, Policy Guidelines for Utilization of Ash was first issued in the year 1993, which were revised / amended from time to time considering the government / regulatory stipulation, changed scenario and enhancing ash utilization. Now, need was felt to focus on fly ash and ash based products business for better revenue realization. The revenue so generated will help for promotional, infrastructure development and facilitation activities to maximize ash utilization in line with MoEF notification. To achieve the above objective, new Policy Guidelines on Ash and Ash based products business have been framed in consultation with stake holders and are being issued as Revision-III for implementation by all NTPC stations.

In the revised policy guidelines provisions for new initiatives such as setting up of large scale automatic fly ash bricks plants, setting up of cement plant by own/ JV, setting up of Light Weight Aggregate plant, use of bottom ash as replacement of sand in ash dyke construction / raising etc have been incorporated for sustainable ash utilization at NTPC stations. HOP's/ RED's have been empowered and made responsible for taking up these activities for maximizing ash utilization at station.

I am sure that the revised guidelines will prove to be important milestone for balancing all the objectives of ash management and will help stations to enhance sustainable ash utilization in line with MoEF gazette notification.

Kaushal Kishore Sharma
Director (Operations)

March 10, 2015

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Our VISION

To be the world's largest and best power producer, powering India's Growth.

Our MISSION

Develop and provide reliable power, related products and services at competitive prices, integrating multiple energy sources with innovative and eco-friendly technologies and contribute to society.

Core Values BE COMMITTED

B	Business Ethics
E	Environmentally & Economically Sustainable
C	Customer Focus
O	Organisational & Professional Pride
M	Mutual Respect & Trust
M	Motivating Self & others
I	Innovation & Speed
T	Total Quality for Excellence
T	Transparent & Respected Organisation
E	Enterprising
D	Devoted

POLICY GUIDELINES ON UTILIZATION OF ASH

1.0 Objective

- To consider ash utilization as an integral process of power generation and make all out efforts so as to maximize ash utilization towards 100% on sustainable basis.
- To facilitate convenient collection of ash for appropriate utilization.
- To promote studies aimed at finding out and evolving innovative methods of ash utilization.
- Increasing fly ash /bottom ash/ pond ash/mound ash utilization at NTPC Power stations by improving ash business process.
- To identify the Potential areas of ash utilisation in the vicinity.
- To facilitate utilization of ash through departmental actions/JVs or other actions by
  - (i) Manufacture / increasing production of fly ash bricks / blocks /tiles/ Light weight aggregate etc for utilization and their marketing for sale,
  - (ii) Equity participation with cement manufacturer/own for setting up fly ash based cement plants and utilizing cement in own construction / upkeep works and also to supply in the market for sale.
- Better revenue realization through fly ash and ash based products business and utilization of this revenue for promotional, infrastructure development and facilitation activities for increasing ash utilization at NTPC station till 100 % ash utilization is achieved in each station as per MoEF Notification 2009.
- To bring about broad based Public awareness and acceptance for ash and ash based products by wide publicity of merits of ash and ash based products and demerits/environment hazards of clay/bricks.

2.0 Terminology

Fly Ash: Ash Extracted from flue gases by any suitable process.

Bottom Ash: Ash collected separately at the bottom of the boiler furnace.

Pond Ash: Fly ash or bottom ash or both mixed in any proportion and conveyed in slurry / paste form and deposited in pond / lagoon.

Mound Ash: Fly ash or bottom ash or both mixed in any proportion and conveyed in dry form and deposited dry.

Cenospheres: Cenosphere is a lightweight, inert, hollow sphere comprised largely of silica and alumina and filled with air and/or gases, float in the lagoons where fly ash is discharged. Cenospheres, lighter than water, are skimmed off of ash ponds, dried and sold for use.

Station/Project/Plant/Site: Any NTPC Unit generating and handling ash.

Adjusted Quantity: The quantity of fly ash which the NTPC is not able to provide to the

buyers due to any reasons including forced outage of the plant, congestion, rain etc. the NTPC accordingly shall adjust the awarded quantity downwardly of each buyer (to be used for the purpose of compensation/ termination).

3.0 Scope and Coverage

3.1 Policy would cover all the existing coal based power stations/units of NTPC and also the future coal based power stations/units.

3.2 The Scope of the policy consists of

a) Making available dry fly ash with suitable loading system including mechanical loading in railway wagon/ tankers/ bulkers/bags for issue to users/ industries/traders etc.

b) Marketing and sale of ash and ash based products to domestic users and export to international markets.

c) Production, transportation and marketing of ash based products like cement / ash bricks/ blocks/ tiles etc.

d) Various types of facilities, incentives, and encouragement to be provided to prospective entrepreneurs/industry for production and marketing of cement/light weight aggregate/ light weight sand /ash bricks/blocks/tiles / concrete etc.

e) Utilization of fly ash, bottom ash, pond ash and ash based products within NTPC for in-house construction /upkeep activities.

f) A vigorous advertising campaign to build up awareness on the beneficial utilization of ash such as use of fly ash in cement/light weight aggregate/light weight sand / mortar, use of ash bricks/blocks/tiles, use of bottom ash as substitute of sand etc.

g) Utilization of bottom ash & pond ash in the nearby areas of NTPC Stations.

h) Enhanced revenue realization from harvesting, collection and sale of cenosphere through ash pond auction.

i) Carrying out/promoting studies and R&D activities for developing innovative methods for new areas of ash utilization and for development of better & cost effective ash based products.

j) Administrative and financial aspects including budget, delegation of power etc.

4.0 Ash Collection, Storage and Weighing system

4.1 NTPC envisages provision of full fly ash collection in dry form along with suitable storage system with facility of separation of fine fly ash & storage of fine ash and coarse fly ash in separate silos; and provision for loading of fly ash into railway wagons/ tankers/ bulkers/bags from silos.

4.2 NTPC shall install their own DAES system and shall commission the DAES system along with the commissioning of the main plant.

4.3 Provision shall be made for weighing of fly ash loaded into tankers/ railway wagons/ bulkers etc under the silo wherever feasible.

4.4 NTPC shall develop standard layout for ash evacuation system for all future thermal

power plants indicating facilities near silo such as access road for easy movement of bulker/larger capacity truck, including railway line for wagon loading, compressed air for cleaning, service water, staff rooms, weighing facility, type of weigh bridge and number of weigh bridge to be installed for weighing empty and filled bulkers/ tankers/wagons so that in a minimum possible time the ash filled truck /bulker/tanker/wagons etc can do exit from plant.

4.5 At Existing Thermal Power Plants, to facilitate increased and easy off take of fly ash, rail loading/ railway siding facility, widening/ strengthening of road, new approach road, modification in silo for pneumatic loading of fly ash in railway wagons/ jumbo bags etc shall be developed wherever feasible. This shall be financed from Ash Fund.

4.6 For utilization of bottom ash, facility of separate collection and storage should be created at all existing stations. All future power projects should have the facility for separate bottom ash collection and storage.

4.7 The NTPC envisages the requirement of efforts for issue of pond ash to users for construction of roads & embankments, structural fills etc. on free of cost basis in line with MoEF notification.

5.0 Development of Ash User Data Base

To develop ash user database, each station should issue notice in regional newspapers inviting all ash users like cement manufacturer, ash brick manufacturer, other ash based enterpreneurs, traders and other potential ash users to register with NTPC with a proforma having details of their area of activity, capacity, quantity of ash required, location details, email ID, telphone number, address and other details.

These ash user data base shall be utilised for enhanced marketing and sale i.e for enhanced utilisation of ash and ash based products.

Further, online web in NTPC station/ units should also be developed for periodic updation of ash user database. The updation and maintenance of data base shall be done by Head of Ash Utilisation Division (AUD) at station/ region/CC.

6.0 Sale of Ash:

6.1 Vigorous marketing/ advertisement campaign should be started by all NTPC stations in local news papers, magazines, cinema halls, schools, public places, signboard, notices etc at various places in vernacular language to build up awareness on the beneficial utilization of ash. Emphasis should be given highlighting merits of Ash bricks viz-a-viz demerits of clay bricks.

Stations in association with RHQ should also organize ash users meet for detailed discussions on the issues / constraints in utilization of ash and to understand their suggestions/ difficulties for enhancing utilization of ash. In this meet, representative from all nearby cement industries, asbestos industries, RMC plants, light weight aggregate manufacturers, light weight sand units, ash bricks/ blocks/ tiles manufacturers, traders, existing users etc shall be invited.

6.2 For sale of fly ash, demand of Cement manufacturers, Ready Mix Concrete (RMC) units, light weight aggregate, other industries etc. shall be worked out. For this a team (marketing team) consisting members from AU, C&M and Finance department of stations shall be constituted by Head of Project at each project/ Station. The coordinator of this team shall be member of AUD. This team will visit to cement plants/ RMC units/ fly ash based products units / light weight aggregate units etc located within 200-250 km. by road & longer distance through rail of the power plant to assess demand for fly ash in these areas and the available sources of fly ash (including NTPC plant) which can cater their demand. Based on this demand, potential of fly ash which can be sold to cement, RMC and other ash based industries should be worked out. If required, a consultant can also be appointed to get the realistic picture of the market for the ash and ash based products along with constraints and solutions for preparing a practically, relevant action plan for the stations. For better results, the payment to the consultants should be linked to his / their performance i.e increase in percentage of ash utilization / increase in revenue realization from the present condition etc. The payment of consultant can be of two parts i.e first part is base part and second part, the major part should be linked to performance. With this approach, the consultant is expected to give practically viable solution for increased ash utilizaion alongwith the revenue realization.

6.3 Based on the market survey for demand for fly ash etc. and total dry fly ash availability at fly ash silo (keeping 20% of total fly ash produced or as per MOEF gazette notification issued from time to time as reserve quantity for bricks/ blocks tiles) the fly ash sale to cement industries, RMC Industries and other ash based products units etc. should be worked out.

6.4 The price band for book building process will be worked out by the same committee constituted at site consisting of members from AU, C&M & Finance considering the market price for fly ash in the vicinity including fly ash sale price in the last contract of the station, if available, transportation/ landed cost of fly ash 'to end users' for maximizing the fly ash utilization.

6.5 Sale of fly ash should be for the total demand assessed by the team/ quantity of dry available at silo (which ever is less) through book building process so as to have better price realization. By this process best price for fly ash will be discovered. The broad specification/ guidelines for book building process are given at **Annexure-A**. For sale of fly ash, E-tendering through book building process should be adopted. If required, E-tendering shall either be done by site C&M Department of each station/ project through SRM module of SAP-ERP or by engaging external agencies like MSTC /M-Junction etc. In either case, site C&M shall be the co-ordinator for this tendering process.

6.6 After successful bid/ sale of fly ash quantity to end users, traders, etc. if the balance fly ash quantity remain available at silo (after above process and reserving 20% fly ash for brick/ blocks and tiles manufacturers or as per MOEF gazette notification issued to time to time), balance available Fly ash quantity may be issued to any other interested agencies on discovered/prevailing price (after inclusion of price adjustment, if applicable, on the discovered price in subsequent years) on first come first serve basis with display/ notices at Station along with information on NTPC web *(Tender)* site on regular basis. AUD shall maintain a register of such agencies who have been approaching for purchasing fly ash. Proposals shall be initiated by site AUD for these cases with specific name of the vendors

to whom the sale order shall be issued. The same shall be reviewed by a committee and put up to HOP/ HOS for approval for issue of sale order.

6.7 After taking above steps (6.1-6.6), the contract period for sale of fly ash on discovered price may be kept between 12-36 months with a price revision clause based on cement price index after every 12 months. These contract agreements should have well defined termination clause, if the actual lifting of fly ash quantity goes below 80% of awarded/adjusted quantity in any consecutive 3 months on cumulative basis.

Price Revision Clause shall be defined in General Terms and Conditions (to be developed by CC-AMG)

In case of termination of any contract due to any reason including poor performance, for immediate utilization of ash, Clause 6.6 shall be applicable till finalisation of new contract.

6.8 If after e-tender, the fly ash quantity shown in the tender, is not tied up with the end users/ agencies/ traders/ cement companies etc. station will make another attempt for e-tender for issue of fly ash and station may continue to honour the existing contracts/ agreements for issue of fly ash. In case the projects/stations do not have the contracts/agreements for sale of ash, such Stations may continue issue of fly ash on “first come first serve basis” without any charges i.e on free of cost basis till the contracts for sale of fly ash are awarded. The process may be repeated in 6-12 month interval. However, AUD site shall maintain a register of such agencies who have been approaching for issue of fly ash on free of cost basis and the quantity of ash issued to them.

6.9 Stations where presently there is a large demand for fly ash such as Dadri, Badarpur, Farakka etc. the practice of sale of fly ash through book building process and e-tender will be followed without conducting of any fresh market survey. The contract period for sale of fly ash on discovered price may be kept between 12-36 months with a price revision clause based on cement price index after every 12 months. These contract agreements should have well defined termination clause, if the actual lifting of fly ash quantity goes below 80% of awarded/adjusted quantity in any consecutive 3 months on cumulative basis.

Price Revision Clause shall be defined in General Terms and Conditions (to be developed by AM-CC and CC-Contracts)

In case of termination of any contract due to any reason including poor performance, for immediate utilization of ash, Clause 6.6 shall be applicable till finalisation of new contract.

The unlifted/balance available fly ash quantity, if any, may be issued to any other interested agencies on prevailing price on first come first serve basis with display/ notices at Station along with information on NTPC web site on regular basis following process mentioned at clause 6.6.

If the lifting of fly ash is reduced considerably (below 60% of available quantity at fly ash silo/ tied up quantity) due to increased availability of fly ash in the vicinity/ any other reason, station may assess the demand as per the above procedure mentioned at clause 6.1 -6.7 and invite fresh bid through book building process for revision of price to enhance fly ash utilization.

6.10 After taking above steps (6.1-6.7), Station may sign MoU/Agreement with end users/ cement industries, Light weight aggregate / sand industries, RMC plants units etc for

issue of fly ash on long term basis (up to 10 years period) with a condition that that fly ash will be issued on prevailing price + price revision based on cement price index after every year or on discovered price at that station, as and when applicable, along with price revision on yearly basis; and with well defined termination clause, if the actual lifting of fly ash quantity goes below 80% of awarded/adjusted quantity in any consecutive 3 months on cumulative basis. Such MoU should be vetted from the Ash Management, CC and legal department of Corporate Centre. (Format for MoU/Agreement shall be developed by Ash Management-CC). On approval of competent authority, MoU shall be signed between the Head of station and the Agency.

6.11 If agency approaches to station specially for fine fly ash, station may tie-up with interested users/ agencies through e-tender process based on highest quoted price (but not less than the discovered price for normal fly ash) and accordingly arrangement for collection of fine fly ash (through PLC system) in separate silo should be done for issue on price wherever feasible.

6.12 Export of Fly Ash

Station may also explore possibility for export of fly ash and ash based products on price through transparent method of EOI and e-tendering on Ex-works basis.

6.13 Existing Commitments/ Consents/ Agreements

Existing commitment made/consents/agreements entered into by NVVN with various industries, suppliers, users etc. shall be continued to be honoured by respective NTPC stations and these commitments shall be administered by NTPC stations till end of such contracts on the same terms and conditions stipulated in the contract.

Station where agency has set up their own DAES system, Agreement/ contract entered with such agency(s) for issue of fly ash may be extended on prevailing market/discovered price of fly ash considering O&M expenditure for mutually agreed period with the approval of HOP.

All these agreements should be reviewed for propriety in the cases where the lifting of ash by the agency is lower than the quantity stipulated in the agreement for the period, the termination clause should be invoked and that quantity should be allotted to new agency after following the due tender process.

7.0 Issue of fly ash to brick/ blocks & tiles manuafcturers

To comply with the stipulations of gazette notification dated 03-11-2009 issued by Ministry of Environment and Forests, at least 20% of dry (ESP) fly ash or any quantity as per gazette issued time to time, shall be made available **free of charge** to units manufacturing fly ash or clay-fly ash bricks, blocks and tiles on a priority basis over other users. If the demand from such agencies falls short of 20% of quantity, such balance quantity of dry fly ash shall be tied up with the end users/ agencies/ traders/ cement companies/ light weight aggregate industries/ light weight sand industries etc on discovered price following process mentioned at clause 6.6 up to 12 months period and it should be reviewed based on the subsequent demand of fly ash by Brick, block, tiles manufacture on regular basis or as and when required.

Before free issue of fly ash, the credentials of the agency should be checked to ensure that agency is actually the ash brick/block / tile manufacturer and the ash is taken for bricks, block and tiles manufacturing only and not for sale as a trader.

The dry fly ash issued “free of cost” should be used only for manufacture of fly ash bricks, clay-fly ash bricks, blocks and tiles and no dry fly ash should be issued to defaulter units. The fly ash brick manufacturer, to whom fly ash has been proposed to be issued on free of cost basis should submit the following documents for verification to Ash Utilization Group of Station before issuance of fly ash to them :

- SSI registration (Part II)/ License to Work as a Factory.
- VAT Registration with Commercial Tax Dept. if applicable.
- Excise Duty Registration as applicable/ documentary evidence for non applicability.
- Pollution Clearance Certificate/ consent order from SPCB.
- Latest power bills/ DG set energy meter reading (Quarterly basis).
- Ash End Use Certificate -on quarterly basis. (Format 1 to 4 enclosed -Annexure B)

In case, the dry fly ash issued on “free of cost basis” to the manufacturer of ash bricks/blocks/tiles have not been utilised for these purposes but sold in the market, permission given for lifting of fly ash to such agency should be terminated and such agency shall be banned for doing business dealing with NTPC .

8.0 Manufacture and Sale of ash bricks/ blocks/ tiles:

8.1 In order to promote use of fly ash bricks/ blocks/ tiles demand survey for fly ash based bricks and other products within 100 km of power plant will also be carried out by Marketing team constituted by HOP/HOS.

8.2 **Green Initiative:** Every station shall set up automatic fly ash brick manuafcturing plant with state of art technology of capacity 1-2 lac brick per day financed from Ash Fund for supply in the market on price to make quality fly ash bricks for use by construction agencies, builders, individuals etc. This shall help to reduce the demand of clay bricks in the vicinity and thus degradation of soils used for manuafcture of clay bricks as well as polution created by brick kilns.

8.3 If station already has brick plant of sufficient production capacity to cater to the need of fly ash bricks in the market, station may plan for increased manufacturing & sale of fly ash brick in the vicinity of power plant , within 100 km. distance.

8.4 Since marketing of fly ash brick in the vicinity will involve number of activities such as procurement of raw materials on regular basis, issue of fly ash bricks to suppliers, maintenance of brick plant, accounting, applicable tax payment etc., a separate group having sufficient manpower will be deputed to look after ash based product business activity.

8.5 Price of fly ash bricks/ other products will be decided by the committee having members from Finance, Contract and Ash Management group of the station. Station shall get the sales tax number, excise duty etc. and other requirements of State/ local authorities so as to ensure smooth marketing of fly ash bricks/ other ash based products.

8.6 Station may appoint agents/ dealers for sale of fly ash bricks/ ash based products through EOI and e-tendering process for which modalities will be finalized by the station with the approval of Head of the Project. The modalities may include issue of finished products on fixed price basis (worked by the committee based on the proposal by site AUD as indicated at clause – 8.5 above) with incentive scheme depending upon the business and freedom to agent/ dealer to sell products at their own price. The price may vary depending on the input cost and demand/ supply condition in the market. The running of brick plant along with marketing of the produce can be outsourced with proper guarantee provisions to capable agency after following due tendering process.

8.7 Station may also explore possibility of forming JVs/ leasing of brick plants to interested brick manufacturer/ agency for optimum capacity utilization. The terms & conditions and modalities will be worked out and finalized separately.

8.8 Station may also explore possibility for setting up large capacity automatic ash brick plant with state of art technology, steam curing system on JV on the basis of techno-economic analysis. The JV partner should be selected through transparent process. Modalities for formation of JV will be worked out separately. In JV route, for better results, providing land, water, electricity, steam and ash by NTPC may be considered after incorporating all necessary provisions and terms & conditions safeguarding the interest of NTPC and approval of CMD, NTPC. It will be prudent to have 51% of stake for NTPC in such JV.

8.9 In the existing stations, fly ash brick plants shall be set up from ash fund. In green field projects, cost of such fly ash brick plant set up by project, shall be integrated with project cost.

9.0 Setting up of Cement plant through its own/ JVs.

9.1 In order to increase fly ash utilization at low demand station where the demand of ash is less than supply or in a area of station where demand of cement is high, Station may plan to set up cement grinding unit financed from Ash fund either by own / under Joint Venture (JV) with cement company on the basis of techno-economic analysis.

9.2 Station may take up feasibility study for setting up of cement plant either by own/ under JVs through EOI/a reputed consultant of this field.

9.3 Based on the recommendation of the consultant on their report, quantity of fly ash utilization and availability of land for setting up of cement plant, station may take up the proposal for approval of CMD, NTPC.

9.4 Selection of company for participation in Joint Venture should be done through transparent system such as EOI /E-tender etc. Modalities for formation JV will be worked out separately.

9.5 Station may also explore possibility of signing MoU / agreement with cement companies for issue of fly ash to cement industries, on long term basis (up to 10 years period) with a condition that that fly ash will be issued on prevailing price + price revision based on cement price index after every year or on discovered price at that station, as and when applicable, along with price revision on yearly basis; and with well defined termination clause, if the actual lifting of fly ash quantity goes below 80% of

awarded/adjusted quantity in any consecutive 3 months on cumulative basis.

Such MoU/ agreement should be vetted from the AM-CC and legal department of Corporate Centre. (Format for MoU/ Agreement shall be developed by AM-CC).

On approval of competent authority, MoU shall be signed between the Head of Station and the Agency.

Price Revision Clause shall be defined in General Terms and Conditions (to be developed by AM-CC and CC-Contracts).

9.6 The running of cement plant along with the marketing of the produce can be outsourced with proper guarantee provisions to capable agency after following due tendering process.

9.7 Price discount of 10 % may be offered to discovered price/prevailing price to the entrepreneur for setting up of cement industries having assured off-take of ash from NTPC station for long period (10 year period) from the date of lifting ash from NTPC station.

10.0 Manufacture of Light Weight Aggregates (LWA)

10.1 Ash based light weight aggregate is a substitute for stone aggregates and if produced in large scale, it can replace the stone and gravel which are getting ever scarce due to restriction in mining on account of environmental issues. Pond ash is suitable material for manufacture of LWA and provides opportunity for utilization of pond ash.

10.2 RHQ/ Station may plan to set up Light Weight Aggregate plant of about 1-2 Lac m^3 / per year capacity financed from Ash Fund at one of the station of the region either by own / under Joint Venture (JV) with reputed company/ ash based products manufacturers on the basis of techno-economic analysis.

10.3 Selection of company for participation in Joint Venture should be done through transparent system such as EOI /E-tender etc. Modalities for formation JV will be worked out separately.

10.4 The running of LWA plant along with the marketing of the produce can be outsourced with proper guarantee provisions to capable agency after following due tendering process.

11.0 Efforts for new area of ash utilization

11.1 Fly ash based light weight sand

At many places mining of sand is being stopped to protect the environment. Due to this, availability of natural sand is getting reduced. Research carried out indicates that fly ash can be utilized for manufacture of artificial light weight sand. Pilot-cum demonstration plant shall be set up by station for manufacture of such artificial sand.

11.2 Fly ash based-Geo-polymer Concrete

Geo-polymer concrete an innovative material that is characterized by long chains of net works of inorganic molecules. Geo-polymer is potential alternative to substitute cement being used in manufacture of concrete. Use of fly ash for manufacture of geo-polymer

concrete has been successfully demonstrated by some of the research institutes.

To develop/ demonstrate this innovation technology, pilot / demonstration project shall be carried out by station for initially construction of concrete road in association with reputed research institute working in this field.

11.3 These activities shall be financed from ash fund.

12.0 Facilities and Incentives

12.1 Concerted efforts will be made by station/ region and Corporate Ash Management Group to propagate NTPC's intention and desire among the prospective entrepreneurs with a view to motivating them to come forward with specific scheme aimed at ash utilization.

12.2 Wherever considered necessary and feasible, appropriate technical/ managerial assistance and marketing information would be provided by NTPC to entrepreneurs to identify such schemes.

12.3 If required, NTPC may render necessary help and assistance to entrepreneurs for facilitating procurement of land, supply of electricity, water, etc from concerned authorities.

12.4 Wherever feasible, NTPC may provide access to railway siding on chargeable basis for movement of railway wagons for fly ash loading at NTPC's silos and transportation. Railway siding facility may be extended to the user /entrepreneurs in a limited manner and wherever it is so extended the plants shall ensure that the requirements of the NTPC units always have precedence and suitable provision to this effect shall be made in the Agreements/ contract.

12.5 Infrastructure development

12.5.1 Construction of new roads (including bridges / culverts), approach roads adjoining of fly ash storage silos / ash dykes, paving of areas adjoining weigh bridge, brick plant, railway siding, fly ash silo area etc. shall be taken up to facilitate fly ash utilization.

12.5.2 Repair / upgrading / strengthening / widening of existing road, approach roads adjoining of fly ash silos, ash dyke or other roads shall be taken up to facilitate ash utilization.

12.5.3 Wherever feasible, laying of railway track under the ash silo and in-motion/ static weighing facility shall be carried out so that fly ash can be loaded directly into railway wagon for bulk transportation of ash.

12.5.4 These works shall be financed from Ash Fund.

12.6 Other activity

12.6.1 Any other activity in connection with improvement of ash utilization/ directives of regulatory authority/ State Government leading to ash utilization and environment improvement may be taken up with specific approval of CMD on case to case basis through Ash Fund.

12.6.2 Ash dyke which has been filled up with ash to its capacity and declared abandoned, area of such ash dyke may be used for Installation of solar panels for Solar Power Plant.

12.6.3 In order to take up research activities for enhancing ash utilization and develop new areas of ash utilization, Research and Marketing centre/ institute shall be set up at NTPC- Korba from Ash Fund.

12.7 Road Embankment Construction

In order to increase ash utilization and achieve ash utilization targets set up by MoEF/ regulatory authority, station may consider for sharing the transportation cost of pond ash for NHAI/ Govt. projects on directive of regulatory authority. Such activity shall be financed from Ash fund.

12.8 Ash Processing Unit

12.8.1 Wherever essential, ash processing units such as fly ash bagging plant, hydra-bin for bottom ash separation etc shall be set up by NTPC on its own and financed from Ash Fund.

12.8.2 Station may set up bagging plant to facilitate off take of fly ash in 50 Kg bags to interested users.

12.8.3 Station may outsource the operation of bagging plant of bagged fly ash to a reputed agency by adopting transparent tender process.

12.8.4 Station may also outsource the comprehensive maintenance through OEM initially for additional two years on newly procured bagging plant.

12.8.5 These activities shall be financed from Ash Fund.

13.0 Auction of ash pond for collection and sale of Cenospheres

Revised guidelines issued by ED(OS) vide ref AM-II/CC/Cenospheres dated 12.11.2014 (Annexure-C) for auction of ash pond for collection and sale of Cenospheres should be followed by all NTPC stations.

14.0 Activities at station for Utilization of Ash

To encourage, promote and utilize fly ash/ bottom ash and pond ash/mound ash following activities shall be undertaken by stations/ regions:

14.1 Use of fly ash in cement concrete, plastering, mortar works (as a part replacement of Ordinary Portland cement) shall be undertaken by NTPC projects/ station (subject to meeting all technical requirements and provisions in BIS code). For this, necessary provision should be made in specifications/ drawings, tender documents and Bill of Quantities.

14.2 Bottom ash as a replacement/substitute of sand as filter material in ash dyke

Bottom ash shall be used as a replacement of sand (filter material) in ash dyke construction works as per the system circular dated 13-11-2014 issued by ED(OS)-Annexure-D.

14.3 Station should explore possibility for use of bottom ash as replacement of sand in cement concrete/ mortar and fly ash brick/ blocks/ tiles manufacturing subject to meeting all technical requirement and provisions in BIS Code.

14.4 In line with provisions of gazette notification dated 03-11-2009, fly ash based products such as Fly ash brick/ tile/ block shall be exclusively used in plant as well as township

construction works. For this, necessary provisions should be made in tender document, specifications and bill of quantities.

14.5 Low lying area development

In order to increase ash utilization at NTPC stations and make use of Ash Sale Fund created by sale of fly ash at NTPC stations, Low lying area development inside of NTPC premises and outside of NTPC within 50 km. of power plant may be taken up using ash and financed from Ash Sale Fund in consultation with concerned individuals/agencies and with **consent of regulatory authorities/ District authority/Municipal Corporation etc.** The guidelines for taking up low lying area development using ash are given vide circular dated 11-09-2013. (Annexure-E)

NTPC Station shall contact higher officials of Municipal corporation/District Magistrate for identification of location/place filling up of low lying area with pond ash/mound ash.

14.6 Raising of existing dykes at NTPC's stations shall be done with the help of ash.

14.7 All Embankments and Road Constructions in NTPC power stations shall be done with the use of ash, wherever feasible.

14.8 Mine filling/stowing

All efforts shall be made by NTPC at Corporate level as well as at Site levels to get the abandoned coal mines identified at nearby coal mines for back filling the same with ash. Specific pilot/ experimental projects in the mines identified by Coal Companies, in this regard, shall also be taken up by various Sites to demonstrate to coal companies, the successful use of ash for mine filling. All required studies shall be done by engaging reputed agencies. This activity will be financed from Ash Fund, if available, otherwise can be financed from O&M cost.

14.9 Wherever there are existing burnt clay brick making units near/ around power stations necessary techno-managerial assistance shall be extended by NTPC station authorities to promote use of ash in making of ash bricks.

14.10 All power stations shall be equipped with fly ash testing equipments at FQA laboratories and test the chemical and physical properties of ash on regular basis as per guidelines issued by Corporate Ash Utilization Division.

14.11 Use of **Fly ash based Portland Pozzolana Cement** shall be made by NTPC in all its construction activities (except in such works which have been identified as "CRITICAL" by Engg. Division vide circular dt. 26.10.93 (Annexure-F).

14.12 Pilot-cum-demonstration units or projects shall be set up by NTPC at identified locations for demonstration of use of ash in specific areas and/ or for demonstrating/ improving new/ existing technologies. Such projects may either be co-sponsored with some recognised institutes/ organizations or self sponsored by NTPC.

Similarly, research, studies on specific areas of ash utilization shall be taken up/ sponsored by NTPC through reputed Institutes/ agencies.

So as to derive maximum benefit from such demonstration projects/ studies as well as to disseminate the results/ information to other Sites, outside bodies, regulatory authorities, etc., these shall be undertaken in association with Corporate Ash Management Group.

14.13 Use of ash in environmentally safe manner in activities such as landscaping, creating of ash mounds etc. shall be undertaken at various site at identified locations.

15.0 Manpower

Utilization/ ash and ash based product business is full time activity and will require sufficient manpower for its success. Required manpower shall be posted/ appointed by HR group. Executives/ working level manpower may be appointed by the station from UPL/ any other suitable agency.

16.0 Issue of Pond ash and Bottom ash

Pond ash / bottom ash shall be continued to be issued to all users on "free of cost" basis. However, transportation shall be the responsibility of users.

NTPC shall facilitate loading of ash from ash pond - to ensure this, the possibility of engaging group of PAPs may be explored.

17.0 Use of ash for Agriculture purpose

Supply of pond ash to farmers field for use of ash in agriculture purpose, within 25 km from ash pond , shall be carried out by NTPC station and financed from Ash Fund.

18.0 Publicity / Awareness

To build-up public awareness on the beneficial uses of fly ash in cement, light weight aggregate, light weight sand, use of bricks/ blocks/ tile, use of bottom ash & pond ash, vigorous awareness campaign shall be carried out by stations through advertisement, local news papers, magazines, cinema halls, public places etc. so as to generate demand for fly ash, bottom ash and pond ash and thus increasing ash utilization.

NTPC's achievements and activities on ash utilization shall be disseminated through publicity, media coverage, etc. at Corporate as well as Site levels.

19.0 Ash Fund

In line with stipulations of MOEF's gazette notification dated 03-11-2009, the amount collected from sale of fly ash and fly ash based products, cenospheres etc by all NTPC's power stations shall be deposited in a separate account Head – "Ash Fund" which will be maintained at Finance department at CC for accounting, disclosure and allocation purposes. This fund shall be allocated for development of infrastructure/ facilities, Promotion & facilitation activities as per the approved guidelines vide circular dated 25-03-2014 (Annexure-G). Activity wise proposals duly vetted by TS and Finance department and approved by HOP/ RED as per applicable clause of NTPC DOP shall be submitted to Corporate Ash Management Group for allocation of fund from Ash Fund.

20.0 Delegation of Power

Applicable Delegation of Power for Ash and Ash based products business is enclosed at Annexure - H.

21.0 Terms and Conditions for contracts / agreement

General Terms and Condition for tendering sale of ash and ash based products need to be prepared by Corporate Ash Utilization Department in association with Corporate Contracts and Finance. This will be a uniform standard/ base document for all sites to use as a part of each fly ash sale tender at site.

However, till the General Terms and conditions are prepared and finalised by Corporate Ash Management Group, stations may continue with present terms and conditions of NVVN suitably modified for respective NTPC station for inviting bids, evaluation and placement of award.

Special Terms and Conditions, if any required at site, shall be proposed by the site AUD along with the **Sale Requisition** (to be developed in SAP/SRM Module). The word "Sale Requisition" should be in line with PR (Purchase Requisition) in our SAP-ERP and enable the same to link with SRM module.

Standard Template for award of sale shall be prepared by Corporate Ash Management Group to maintain the uniformity amongst all the projects.

Standard Template for agreement for lifting of ash shall be prepared by Corporate Ash Management Group to maintain the uniformity amongst all the projects.

22.0 Compliance of MoEF notification amendment dated 03-11-2009

This ash utilization policy empowers Head of Power station in all the aspects of ash utilization and makes them responsible for compliance of all guidelines issued by MoEF, Central & State Pollution Control Board and other statutory bodies. HoP's are also responsible and answerable for achieving targets set by MoEF for ash utilization.

REDs shall monitor and guide the implementation of this policy to ensure ash utilization as per MoEF guidelines and targets.

Activities & Responsibilities relating to setting up of brick plants, cement plants and Light Weight Aggregate plants covered in the policy guidelines are enlisted and enclosed at Annexure-I.

These policy guidelines shall supersede the earlier policy guidelines issued for Ash Utilization.

Annexure-A

Price discovery by Book Building

First a price range has to be fixed (based on demand and supply of fly ash in the region) for discovery of single price. Say the price range is fixed from Rs.100/- to Rs.600/- PMT for discovery of price. The following steps may be followed for discovery of single price.

1) Methodology for Pricing

a) Price chargeable to buyer(s) shall be the price discovered resulting from the bids received as per the methodology described below in Rupees per MT.

b) All statutory duties / taxes / levies shall be charged extra.

2) Price & Bidding Methodology

a) The minimum **FLOOR PRICE of Fly Ash is (say) ₹100.00** (Rupees one hundred only) per Metric Ton and **Ceiling price (say) ₹ 600.00** (Rupees six hundred only) per Metric Ton. Bidders may quote the annual quantity required against a price starting from the floor price and in multiples of ₹10 (Ten) i.e. ₹ 100, 110, 120 …….and so on upto the ceiling price of ₹ 600 per MT.

b) Parties may quote different quantity they would like to off-take at different rates within the specified range. The quantity at particular rate, quoted by the bidder shall be deemed acceptable for evaluation / allocation towards all the rates below the quoted rate, unless otherwise specifically mentioned. (See Example below)

Example:

Rate (₹/MT)	Party A Quantity (MT/annum)	Party B Quantity (MT/annum)	Party C Quantity (MT/annum)
100			50000
110…			
300		45000	40000
310…			
400			30000
410…			
550		30000	20000
560…			
600	50000		10000

Case 1: **Quantity 50000 MT quoted by the party A against the rate of ₹600 shall be valid for all the rates up to ₹100 which is below ₹600 since the party has not quoted any quantity against the rate of ₹550, ₹400, ₹100 etc.**

Case 2: **The quantity 30000 MT quoted by the party B against the rate of ₹550 shall be valid for the rate up to ₹310 only, since the party has specified the quantity of 45000 MT against the rate of ₹300 and this quantity of 45000MT shall be valid up to ₹100.**

Case 3: **The quantity of 10000 MT quoted against price ₹600 shall be valid upto ₹560 and quantity 20000 MT quoted against price ₹550 shall be valid upto ₹410 and so on i.e. quantity 40,000 MT quoted at ₹300 shall be valid upto ₹110 and quantity 50,000 MT shall be valid for ₹100 only.**

3) Bids price quoted below ₹100.00 per MT and or above Ceiling price of ₹600.00 per MT will not be considered.

4) Evaluation Criterion of Bids

Price Discovery and Quantity for allocation

a. 90% (or say 80%) of the tendered quantity will be the lower limit for bid evaluation below which the tender will be declared unsuccessful.

b. For cumulative annual quantities quoted by bidders between 90% (or say 80%) of the tender quantity to 100% of tender quantity, the price at which maximum revenue is generated will be the discovered price. In such case, the quantity quoted by the party at the discovered price will be allocated to the party.

c. In case the cumulative quantity quoted by the bidders does not fall between 90% (or say 80%) and 100% of the tender quantity but above the tendered quantity, the discovered price shall correspond to the cumulative quantity nearest to 100% and the allocated quantity shall be modified on prorata basis to the tendered quantity.

d. Bids at discovered price and above will be the successful bids and quantity will be allocated to them as per **Clause 4 b & c.**

5) Award Criteria

The party shall be awarded the quantity as quoted at discovered price. If cumulative quantity at discovered price is more than tendered quantity, party shall be allocated the quantity on prorata basis.

6) Award price:

Discovered Price shall be the award price and shall remain firm for a period of __ year.

Example:

Methodology for Bid Evaluation - Trial Sheet for Demo purpose only

Basic parameters : Price range, cut off for evaluation

Tender Qty. : 9.0 LMT/annum **Price range: ₹150/- PMT to ₹600/-PMT** **Cut off: 90% of the tender qty. i.e 8.1 LMT/annum**

Sl. no	Price range (Rs./MT)	Requirement of bidders										TotalTotal Revenue (₹ in Crores)	Requirement of bidders (MT/annum)
		Party A	Party B	Party C	Party D	Party E	Party F	Party G	Party H	Party I	Party J	Party K	
1	150	50000	200000	250000	200000	300000	200000	250000	20000	200000	150000	50000	1870000	28.050	1870000
2	155	50000	200000	200000	NQ	160000	200000	250000	20000	200000	150000	50000	1480000	22.940	1480000
3	160	50000	200000	200000	NQ	160000	200000	250000	20000	200000	150000	50000	1480000	23.680	1480000
4	165	50000	200000	200000	NQ	160000	200000	250000	20000	200000	150000	50000	1480000	24.420	1480000
5	170	50000	200000	200000	NQ	160000	200000	250000	20000	200000	150000	50000	1480000	25.160	1480000
6	contd..	50000	200000	200000	NQ	160000	200000	250000	20000	200000	150000	50000	1480000		
7	200	**50000**	**200000**	**200000**	NQ	**160000**	**200000**	**250000**	20000	200000	150000	50000	1480000	29.600	1480000
8	205	30000	100000	120000	NQ	80000	100000	100000	20000	200000	150000	50000	950000	19.475	950000
9	210	30000	100000	120000	NQ	80000	100000	100000	20000	200000	150000	50000	950000	19.950	950000
10	215	30000	100000	120000	NQ	80000	100000	100000	20000	200000	150000	50000	950000	20.425	950000
11	220	30000	100000	120000	NQ	80000	100000	100000	20000	200000	150000	**50000**	950000	20.900	950000
12	225	**30000**	100000	120000	NQ	80000	100000	100000	20000	200000	150000	NQ	900000	20.250	900000
13	230	NQ	100000	120000	NQ	80000	100000	100000	20000	200000	150000	NQ	870000	20.010	870000
14	contd...	NQ	100000	120000	NQ	80000	100000	100000	20000	200000	150000	NQ	870000		
15	270	NQ	100000	120000	NQ	80000	100000	100000	20000	200000	150000	NQ	870000	23.490	870000
16	**275**	**NQ**	**100000**	**120000**	**NQ**	**80000**	**100000**	**100000**	20000	200000	150000	**NQ**	**870000**	**23.925**	**870000**
17	280	NQ	100000	120000	NQ	80000	NQ	100000	20000	200000	150000	NQ	770000	21.560	770000
18	285	NQ	100000	120000	NQ	80000	NQ	100000	20000	200000	150000	NQ	770000	21.945	770000
19	290	NQ	100000	120000	NQ	80000	NQ	100000	20000	200000	150000	NQ	770000	22.330	770000
20	295	NQ	100000	60000	NQ	80000	NQ	100000	20000	200000	150000	NQ	710000	20.945	710000
21	300	NQ	**100000**	60000	NQ	**80000**	NQ	**100000**	20000	200000	150000	NQ	710000	21.300	710000
22	contd...	NQ	NQ	60000	NQ	40000	NQ	NQ	20000	200000	150000	NQ	470000		470000
23	330	NQ	NQ	60000	NQ	40000	NQ	NQ	20000	200000	150000	NQ	470000	15.510	470000
24	335	NQ	NQ	60000	NQ	40000	NQ	NQ	20000	200000	150000	NQ	470000	15.745	470000
25	340	NQ	NQ	60000	NQ	40000	NQ	NQ	20000	200000	150000	NQ	470000	15.980	470000

Sl. no	Price range (₹/MT)	Requirement of bidders											Total Requirement of bidders (MT/annum)	Total Revenue (₹ in Crores)
		Party A	Party B	Party C	Party D	Party E	Party F	Party G	Party H	Party I	Party J	Party K		
26	345	NQ	NQ	60000	NQ	40000	NQ	NQ	20000	200000	150000	NQ	470000	16.215
27	350	NQ	NQ	60000	NQ	40000	NQ	NQ	**20000**	200000	150000	NQ	470000	16.450
28	355	NQ	NQ	60000	NQ	40000	NQ	NQ	NQ	200000	150000	NQ	450000	15.975
29	360	NQ	NQ	60000	NQ	40000	NQ	NQ	NQ	200000	150000	NQ	450000	16.200
30	contd…	NQ	NQ	60000	NQ	40000	NQ	NQ	NQ	200000	150000	NQ	450000	
31	400	NQ	NQ	60000	NQ	**40000**	NQ	NQ	NQ	200000	150000	NQ	450000	18.000
32	405	NQ	NQ	60000	NQ	20000	NQ	NQ	NQ	200000	150000	NQ	430000	17.415
33	410	NQ	NQ	**60000**	NQ	20000	NQ	NQ	NQ	200000	150000	NQ	430000	17.630
34	415	NQ	NQ	NQ	NQ	20000	NQ	NQ	NQ	200000	150000	NQ	370000	15.355
35	420	NQ	NQ	NQ	NQ	20000	NQ	NQ	NQ	200000	150000	NQ	370000	15.540
36	425	NQ	NQ	NQ	NQ	20000	NQ	NQ	NQ	200000	150000	NQ	370000	15.725
37	430	NQ	NQ	NQ	NQ	20000	NQ	NQ	NQ	**200000**	150000	NQ	370000	15.910
38	contd..	NQ	NQ	NQ	NQ	20000	NQ	NQ	NQ	NQ	150000	NQ	170000	
39	470	NQ	NQ	NQ	NQ	20000	NQ	NQ	NQ	NQ	150000	NQ	170000	7.990
40	475	NQ	NQ	NQ	NQ	20000	NQ	NQ	NQ	NQ	150000	NQ	170000	8.075
41	480	NQ	NQ	NQ	NQ	20000	NQ	NQ	NQ	NQ	150000	NQ	170000	8.160
42	485	NQ	NQ	NQ	NQ	20000	NQ	NQ	NQ	NQ	150000	NQ	170000	8.245
43	490	NQ	NQ	NQ	NQ	20000	NQ	NQ	NQ	NQ	150000	NQ	170000	8.330
44	495	NQ	NQ	NQ	NQ	20000	NQ	NQ	NQ	NQ	150000	NQ	170000	8.415
45	500	NQ	NQ	NQ	NQ	**20000**	NQ	NQ	NQ	NQ	**150000**	NQ	170000	8.500
46	510	NQ	NQ	NQ	NQ	NQ	NQ	NQ	NQ	NQ	NQ	NQ	0	0
47	contd..	NQ	NQ	NQ	NQ	NQ	NQ	NQ	NQ	NQ	NQ	NQ	0	0
48	600	NQ	NQ	NQ	NQ	NQ	NQ	NQ	NQ	NQ	NQ	NQ	0	0

NB: NQ : Not quoted

The quotes in bold implies that the party has quoted against these rates and the same is extended to lower prices till another quote, if not extend till the lowest price.

This helps in tabulating the cumulative demand and revenue at a particular price.

i.e Party A has quoted at two prices : at ₹225/- PMT, 30,000MT/annum and at ₹200/- PMT, 50,000 MT/annum and extended accordingly

Similarly Party D has quoted at ₹150/-PMT for 200,000 MT/annum only and therefore not eligible for higher prices

Similarly Party J has quoted at ₹ 500/-PMT for 150,000 MT/annum and hence applicable for all rates below ₹500/-PMT i.e upto ₹150/- PMT

Discovered price is ₹275/-PMT as it is higher than the cut off limit of 90% (i.e 8.1 LMT/ann) with maximum revenue between 8.1 LMT and 9.0 LMT/annum.

Methodology for Bid Evaluation - Trial Sheet for Demo purpose only

Example 1		
Price range in ₹	Cumulative Quantity Quoted by bidders (Lakh MT)	Revenue Generated (₹ in Crores)
contd…		
275	7.8	21.45
270	8.0	21.60
265	8.2	21.73
260	8.4	21.84
255	8.6	21.93
250	8.8	22.00
245	**9.0**	**22.05**
240	9.2	22.08
contd…		

Example 2		
Price range in ₹	Cumulative Quantity Quoted by bidders (Lakh MT)	Revenue Generated (₹ in Crores)
contd…		
350	7.8	27.30
340	8.0	27.20
330	**8.2**	**27.06**
320	8.4	26.88
310	8.6	26.66

Example 3		
Price range in ₹	Cumulative Quantity Quoted by bidders (Lakh MT)	Revenue Generated (₹ in Crores)
contd…		
500	7.8	39.00
490	8.0	39.20
480	8.2	39.36
470	8.4	39.48
460	8.6	39.56
450	**8.8**	**39.60**
440	9.0	39.60
430	9.2	39.56
contd…		

NB:In case where the cumulative qty. at differenet prices falls between the cut off qty. and tender qty., then the discovered price corresponds to the price with maximum revenue, highlighted in **bold**.

In cases where the cumlative quantity quoted does not fall between the cut off qty. and tender qty. but is more than 100% of the tender quantity, then Price discovery will be as shown below (i.e cumulative qty. nearest to the tender qty.) and award qty. reduced prorata to tender qty.

Example 1		
Price range in ₹	Cumulative Quantity Quoted by bidders (Lakh MT)	Revenue Generated (₹ in Crores)
contd…		
275	6.5	17.88
270	7.0	18.90
265	7.5	19.88
260	8.0	20.80
255	**9.5**	**24.23**
250	9.7	24.25
245	9.9	24.26
240	10.5	25.20
contd…		

Example 2		
Price range in ₹	Cumulative Quantity Quoted by bidders (Lakh MT)	Revenue Generated (₹ in Crores)
contd…		
350	6.5	22.75
340	7.0	23.80
330	7.5	24.75
320	7.9	25.28
310	**9.3**	**28.83**
300	9.7	29.10

Example 3		
Price range in ₹	Cumulative Quantity Quoted by bidders (Lakh MT)	Revenue Generated (₹ in Crores)
contd…		
500	6.5	32.50
490	7.0	34.30
480	7.5	36
470	8.0	37.6
460	**9.6**	**44.16**
450	9.7	43.65
440	9.9	43.56
430	10.5	45.15
contd…		

NB : Prices highlighted in bold will be the discovered price

Quantity tendered : 9.0 lakh MT (i.e 100%)

Cut off quantity : 8.1 lakh MT (i.e 90 %)

Format& 1 of Annexure - B

संदर्भ संख्या दिनांक

सेवा में
श्रीमान अपर महाप्रबंधक
ई० एम० जी० / ऐ०यू०

विषय : फ्लाई ऐश के इस्तेमाल के सबंध में

महोदय,

आपके पत्र दिनांक के संबंध में हम अपने कार्य / प्लांट के संबंध में निम्न विवरण प्रस्तुत करते हैं:

1) पिछले तीन माह में उठाई गयी राख से तैयार उत्पादों का विवरण
   अ) उठाई गई राख की मात्रा
   ब) उत्पादों का नाम व मात्रा
2) पिछले तीन माह में जमा किया उत्पादक शुल्क / बिक्री कर का विवरण
3) आज की तारीख में प्लांट / कार्य का विवरण
   अ) प्लांट / कार्य का पूरा पता, मालिक का नाम
   ब) प्लांट की क्षमता
   स) कार्य / बनाये जाने वाले उत्पादों का नाम
      प्रतिदिन कार्य / बनाये जाने वाले उत्पादों की मात्रा
   द) आज की तारीख में राख की कुल आवश्यकता
      i) फ्लाई राख
      ii) बॉटम राख
   य) ढुलाई तथा कार्य के दौरान राख न उड़े इसके लिए प्रबंध

एन०टी०पी०सी० प्लान्ट से राख की ढुलाई व जिन कार्यो में इस्तेमाल की अनुमति ली है उसी कार्य में राख का इस्तेमाल कर रहे हैं व इस बात का भी पूरा ख्याल रख रहे हैं की ढुलाई के दौरान राख न उड़े और आसपास के वातावरण को प्रदूषित न करे।

सधन्यवाद

भवदीय
मै०.....
.....

Format-2 of Annexure - B

संदर्भ संख्या दिनांक

सेवा में
श्रीमान अपर महाप्रबंधक
ई० एम० जी० / ऐ०यू०
विषय : फ्लाई ऐश उठाने की परमीशन के सबंध में।
महोदय,
हम आपके प्लान्ट एन०टी०पी०सी० ..... से पहले आओ पहले पाओ के आधार पर फ्लाई ऐश मुफ्त में उठाने के विषय में पता चला है। श्रीमानजी हम आपके यहाँ से राख उठाना चाहते है हमारे तथा हमारे व्यापार का विवरण निम्नप्रकार है।

01 मालिक / प्रोपराइटर / साझेदारी का नाम व पता
02 राख किस कार्य के लिए चाहिए
03 उपरोक्त कार्य के लिए सेल्स टेक्स न० (प्रमाण संलग्न
04 टीन न० प्रमाण संलग्न
05 जगह का विवरण / पता आदि जहाँ कार्य करना चाहते है।
06 प्लान्ट की क्षमता / उत्पाद की मात्रा प्रतिदिन
07 प्रतिदिन राख की आवश्यकता
08 ढुलाई के दौरान राख न उड़े इसके लिए प्रबंध
09 कार्य के दौरान राख न उड़े इसके लिए प्रबंध
10 राख परिवहन में प्रयुक्त किए जाने वाले वाहन का विवरण, निजी अथवा ट्रांसपोटर जिसके लिए परमीशन चाहिए गाड़ी का इंश्योरेंस व ग्रुप इंश्योरेंस की प्रति संलग्न।

श्रीमानजी हम इस बात की अन्डरटेकिग देते है कि :–

01 जिस कार्य के लिए हमें राख उठाने की अनुमति मिली है / मिलेगी, उसी कार्य में इस्तेमाल करेंगे तथा कोई दुरुपयोग नहीं करेंगे।
02 परिवहन व इस्तेमाल के दौरान राख न उड़े और आसपास के वातावरण को प्रदूषित न करे इस बात का पूरा ख्याल रखेंगे।
03 पर्यावरण सुरक्षा एव प्रदूषण नियंत्रण संबंधी नियमों का पूरा पालन करगे
04 प्रत्येक तीन माह के बाद आपको यहा से उठाई गयी राख व बनाये गये उत्पादो की मात्रा का विवरण आपको देंगे।
05 बनाये गये उत्पादों से संबंधित सरकार द्वारा लागू संवैधानिक दायित्व का पालन करेंगे।

श्रीमानजी हमारे द्वारा दी गई उपरोक्त सभी जानकारी सही है तथा हम उपरोक्त सभी शर्तो का पूर्णतया पालन करंगे तथा यह भी भली–भाति विदित है कि उपरोक्त जानकारियां सही न होने तथा शर्तो को न मानने की दशा में हमारी परमिशन रद्द की जा सकती है।

सधन्यवाद भवदीय
मै०.....

Format-3 of Annexure - B

Ref. No.: ..... Date: .....

To,
.....
.....
.....

Sir,

To consider your allocation of free issue of fly ash for bricks/ blocks / tiles manufacturing, you are required to submit the copy of following documents:

- SSI registration (Part II)/ License to Work as a Factory.
- VAT Registration with Commercial Tax Dept. if applicable.
- Excise Duty Registration as applicable/ documentary evidence for non applicability.
- Pollution Clearance Certificate/ consent order from SPCB.
- Latest Power Bills/ DG set energy meter reading (Quarterly basis).
- Ash End Use Certificate (on quarterly basis).

Thanking you,

Yours faithfully
(.....)

Format-4 of Annexure - B

Ref. No.: ..... Date: .....

To,
.....
.....
.....

Sub: Validation & Verification of free issue fly ash requirement for your Brick & Blocks manufacturing unit.

Sir,

As an annual exercise of checking of proper utilization of free issue fly ash for brick & blocks manufacturing activity, you are requested to come in the office of undersigned with following documents:

1) Valid Original Sales Tax Registration Certificate.
2) Photographs/ video of brick manufacturing activity.
3) Invoice of brick/ block Machine or any other similar proof/documentary evidence.
4) Proof of actual amount deposited of Sales Tax in the financial year.
5) Any other evidence supporting functioning of your brick plant.
6) Photo ID/Address proof of Owner of the unit.

In case you fail to appear in the office of undersigned before 31st March 20.... , it will reflected that your unit is no more actively manufacturing bricks/ blocks and we shall be constrained to suspend issue of fly ash in name of your firm.

Thanking you,

Yours faithfully
(.....)

Annexure-C

NTPC Limited
(Ash Management Group)

Ref.: AM-II/CC/Cenospheres Date: 12.11.2014

Sub: Guidelines for auction of ash pond for collection and sale of cenosphere

1.0 Framework for Bidding:

i) Ash pond(s) are to be auctioned through the process of bidding.

ii) Bids shall be invited through an open tender by following the tendering process of single stage two sealed envelopes (one containing techno commercial bid and other envelope containing the price bid).

iii) Reserve price for a station should be mentioned in the bidding document.

iv) Participating bidder shall meet the specified qualifying requirement.

v) The party quoting the highest price equal to or above the reserve price shall be awarded the contract. If highest price quoted is below the reserve price, the tender will be considered unsuccessful.

vi) Duration of contract shall be for a period of **one year.**

vii) Pond shall be auctioned on as is where basis without any assurance of quantity or quality of cenosphere is available in the pond.

1.1 Reserve Price

Reserve Price (RP) shall be determined by a committee consisting of members from AUD, Contracts and Finance of NTPC station and one member from NTPC-RHQ. It is proposed to consider the consultant's report initially for assessing the quantity of cenosphere to be generated for arriving at the reserve price i.e :

'Cenosphere quantity to be calculated @ 0.01 to 0.02% of the quantity of ash discharged at ash pond starting initially with 0.01% of the fly ash quantity (discharged) in the ash pond'.

The basic formula proposed for determination of Reserve Price (RP)/annum is:

RP/ annum = 0.9*(0.01% * Average Qty/annum of fly ash expected to be discharged during the period of proposed contract in the ash pond) * latest selling price of cenosphere at NTPC station,

Wherein

i) The qty. of fly ash/ annum expected to be discharged during the period of proposed contract in the ash pond shall be provided by respective stations. In case new unit(s) is/ are scheduled for commissioning during the proposed contract period, fly ash quantity shall be considered accordingly.

ii) The RP is reduced to 90% to take care of collection/ harvesting/ overhead charges etc. as

last selling price of cenosphere (which does not include the harvesting and overhead charges) has been considered for RP calculation.

In future, based on experience gained the percentage of collection may vary from 0.01% to 0.02%.

(A committee consisting of one member each from NTPC AMG CC and NETRA constituted for studying the feasibility of implementing the recommendation given by the consultant have submitted their report to D(O) in which they have observed that

"in order to auction the ash pond of the station for cenosphere collection, estimated dry cenosphere quantity may be considered initially @ 0.01% of the fly ash disposed off into the ash pond as recommended by the consultant in the report. However, site may modify the target collection percentage based on the condition of the ash dyke and past experience". In view of the above recommendations, the RP may be modified taking into account the condition of ash pond.)

In case tender is unsuccessful with the above RP formula, the RP may be reviewed by the committee, taking into account the following factors for a re-tender:

a) Capacity /age of the plant / station

b) Condition of the ash pond(s)

c) Cenosphere collection history, if any

d) Quotations received in the unsuccessful tender

e) Any other relevant information

1.2 Qualifying Requirement

i) The bidder should be a company or a firm.

ii) The Bidder should have at least one year experience in harvesting of cenosphere from Ash Pond of a coal based thermal power plant of capacity 200 MW or above prior to the date of bid opening.

iii) The Bidder who are in the business of Cenosphere and do not meet the requirement at (ii) above, can also participate provided the bidder Collaborate(s)/ Associate(s) with the party who meet the requirement under (ii) above, which the Bidder itself is not able to meet.

iv) Bidder seeking qualification through clause No. (iii) shall furnish undertaking jointly executed by it and its Collaborator/ Associate for the successful performance of the contract as per owners format enclosed in the Bidding documents. The deed(s) of joint undertaking(s) shall be submitted along with the Techno-Commercial Bid, failing which the Bidder shall be disqualified and its Techno-Commercial Bid shall be rejected. Further, in case of award, Bidder's Collaborator(s)/Associate(s) shall be required to furnish an on-demand Bank Guarantee as per the format enclosed with the Bidding documents for a value equal to 1% (one percent) of the total contract price in addition to the Contract Performance Security to be furnished by the Bidder.

v) The average annual turnover of the Bidder, in the preceding three (3) financial years as on the date of Techno - Commercial bid opening shall not be less than Reserve Price/annum (in the bid document only required turnover shall be mentioned)

1.3 Security Deposit and CPG

a) Each bidder has to submit an EMD equivalent to 2% of the Reserve price alongwith their bid.

b) CPG shall be equivalent to 10% of the annual value of the contract.

1.4 Criteria for evaluation

a) The party quoting the highest price equal to or above the reserve price shall be awarded the contract.

b) The successful bidder shall have exclusive rights for collection and sale of cenosphere from the station.

1.5 Payment Details

The bidder on whom award is placed shall submit 20% of the annual award value within one month of placement of award. The balance payment of annual award value shall be deposited within 4,7,10, months of award for 20%, 30% and 30% respectively.

1.6 For Quotations below the Reserve Price

Quotations received below the reserve price shall be rejected. If all quotations received are below the Reserve price, the tender will be declared unsuccessful and the reserve price may be re-examined as per para 1.1 for a retender.

1.7 Other terms & conditions of the contract viz.. NTPC GCC, Special conditions etc. shall be approved by HOP/RED.

1.8 Other Relevant Inputs

a) One party/bidder can participate in one or more stations.

b) Each station shall be evaluated separately.

c) The successful bidder shall not construct any permanent or temporary structure in the ash pond unless permitted by EIC.

d) Bidder shall indemnify NTPC from any liability arising due to any mistake/ accident/ injury/ death to any person associated or involved with the contract / contractor during the contract period.

e) Bidder shall not indulge in any activity which may jeopardize the security of ash pond or hinder in the operational and maintenance requirement of the plant.

f) If there is any damage to ash dyke or NTPC property or third party due to activity undertaken by bidder for collection of cenospheres, bidder shall indemnify NTPC for any liability arising for correction as well as consequences to NTPC/ third party.

g) Requirement of plant shall be reign supreme w.r.t charging / stopping of any pond.

h) Bidder to satisfy themselves about the potential of cenosphere quantity before bidding for which the site will provide necessary assistance.

i) No material other than cenosphere shall be collected by the successful bidder.

j) The bidder shall be responsible for meeting all applicable statutory requirements under various Acts viz. relating to risk and liability of its workforce, applicable taxes & duties, necessary licenses, clearances etc.

k) Bidder to furnish in the bid, details of latest technology to be adopted by them to skim off the cenosphere from ash pond(s).

l) Scope of work shall include collecting/ harvesting/transportation/disposal of cenosphere from ash pond(s).

2.0 Additional factors

a) Initially all RED's shall ensure and allow to take up cenosphere harvesting from ash pond through bidding process only at those stations under their control where free board margin is available while ensuring safety of ash dyke.

b) Based on RED's approval, respective NTPC station shall prepare the bid document, call bids, place award and receive payments. An Engineer in charge (EIC) shall be designated by the respective station.

c) RHQ - AUD shall ensure parity in the bid document of its stations.

Sd/-
(Y. V. Rao)
Executive Director (OS)

Annexure-D

NTPC LTD.
OPERATION SERVICES
(Ash Management Group)

Date: 13/11/2014

Sub: System Circular for use of bottom ash as a substitute for sand as filter material in ash dyke works

The Committee constituted to study the use of bottom ash as a substitute for sand as filter material in ash dyke works has given following recommendations:

i) Bottom ash has the potential to be used as filter in ash dyke.

ii) If the permeability criteria of Cl. 7.1.1.2 of IS: 9429 is satisfied and D_{15} (F) particle size is not lesser than 0.1 mm, bottom ash is permitted for all soils other than type 1 soil of table 2 of IS: 9429.

iii) For type 1 soil D_{15} (F) particle size should not be lesser than 0.2 mm.

iv) Material passing through 75µ size sieve shall not exceed 7% (Note 1 of clause 7.1.1.3 of IS: 9429).

v) Mill rejects (size varying from 6 mm to 30 mm) has the potential to be used as coarse filter in place of coarse aggregate in rock toe and drain.

In view of above the stations may take necessary action to use bottom ash as a substitute to sand as per above criteria and mill rejects as a substitute of coarse aggregate in rock toe and drain. Stations may also take necessary steps to separate bottom ash disposal and take approval of OS/ Engg., so that bottom ash is directly available at ash pond. Bottom ash permeability also should be monitored periodically during dumping at dyke. In case of deviation from using bottom ash as filter material the same should be done only after obtaining specific approval from Corporate Engg. well in advance.

Sd/-
(Y. V. Rao)
Executive Director (OS)

Annexure-E

NTPC LTD.
Corporate Ash Management Group
Circular

Ref. AM-II/Policy/land fill

Date: 11-09-2013

Sub: Low lying area development using ash inside of NTPC stations and outside NTPC stations within 50 km radius from Ash Sale Fund.

In order to increase ash utilization at NTPC stations and make use of Ash Sale Fund created by sale of fly ash at NTPC station:-

i. Low lying area development inside of NTPC premises and outside of NTPC within 50 km. of power plant shall be taken up using ash and financed from Ash Sale Fund.
ii. The delegation of power for administrative and award approval for such activities shall be as per the provision in section – II of DOP 2011 for O&M works.
iii. The schemes envisaging ash utilization by evacuating ash from ash pond on sustainable basis for more than one year period such as mine backfilling, road embankment construction shall be taken up from DCO/ capital budget.
iv. The guidelines for taking up low lying area development using ash are given in the enclosed Annexure-1.

This has been approved by competent authority and may be taken up for implementation by all NTPC's coal based thermal power plants.

Sd/-
(Ajit Kumar)
AGM (I/c)- Ash Management Group

Annexure-1

Guidelines for Low Lying area development using Ash

1. **Specification:** Low lying area development with ash shall be taken up adopting standard practices. For this a typical technical specification is enclosed Appendix – I.

2. **Consent from land owner:** Consent/ permission should be obtained in writing from the land owner before start of work.

3. **Prevention of pollution:** Necessary arrangement should be made to prevent pollution during excavation of pond ash at ash pond, filling area and during transportation of ash by sprinkling of water covering of trucks etc. Care should taken that no ash should spill from truck on the road during transportation of ash.

4. **Soil Cover at top of ash fill:** As per the system circular earlier issued vide dated 04-03-09 (Appendix – II) and MOEF gazette notification of ash utilization dated 14-09-1999 and is amendment dated 27-08-2003 and 03-11-2009, the soil required for soil cover shall be excavated from land fill site itself and kept separately before taking 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 soil borrow area. The voids created due to soil borrow area shall be filled up with ash with proper compaction and covered at top with soil cover. As per the standard practice about 300-500 mm thick soil layer shall be placed over the ash fill area. This should be done as an integral part of low lying area development work.

5. **Measurement:** For measurement of fill quantity pre & post levels of borrows area in the ash pond & filling area shall be taken up as per the standard methodology (Appendix-II).

6. **Permission from Regulatory authority:** Station/ land owner/ agency shall obtain statutory clearances from regulatory authorities as per the requirement.

Appendix – I

TYPICAL TECHNICAL SPECIFICATIONS FOR AREA FILLING WITH POND ASH

Ash Utilization Division, NTPC

1.0 PREPARATION OF FILLING AREA

1.1 The entire area meant to receive the ash and earth filling shall be stripped to a depth of minimum 150 mm. The exact depth of stripping shall be decided by the Engineer-in-Charge depending upon nature of top soil and the vegetation present.

All organic matter, vegetation, roots, stumps, bushes, rubbish, swamp materials, etc. shall be removed from the site. The stripping material and other unsuitable materials as referred above shall be kept far away from the area to be filled up so that these do not get mixed up with filling material and disposed off to a place as directed by the Engineer-in-Charge.

1.2 De-watering

If the area happens to be waterlogged, ground water table of site shall be lowered by dewatering the same so that proper compaction of fill material at around optimum moisture content can be ensured.

1.3 Levelling

All existing undulations, holes, cavities, excavations made for plate load rests and other soil investigations, etc. shall be filled with pond ash having requisite moisture content. The ash thus filled shall be compacted with the help of vibratory rollers so as to achieve Dry Density of not less than 95% of Maximum Dry Density found out as per I.S – 2720 (Part-VII). This would result in a levelled surface upon which layer wise filling of compacted ash can be done.

2.0 EXCAVATION OF POND ASH FROM BORROW AREA

2.1 Borrow Area-location

The location and permissible depth of excavation of the Borrow areas for pond ash shall be got specifically approved from General Manager of concerned Thermal Power Station or his nominee. The boundaries and permissible depth of excavation so approved shall be strictly followed and no deviation shall be allowed. Similarly, routes for movement of all ash-transportation vehicles, water tankers, equipment, etc. shall be got approved from Thermal Power Station authorities. These shall be strictly followed and no deviation shall be allowed. Contractor shall be solely responsible for any damage caused to works of Thermal Power Station such as dykes, transport routes, other structures, etc. and shall undertake all measures to the satisfaction of Thermal Power Station authorities to keep such works in proper condition.

Borrow area shall be so operated so as not to impair the usefulness or mar the appearance of any part of work or any other property. The excavation surfaces and surface of waste

materials shall be left in a reasonably smooth and even condition. All the excavations within the ash pond shall be at a minimum slope of 4 (Horizontal): 1(Vertical)

2.2 Site Clearance

All areas required for borrowing shall be cleared of all trees and stumps, roots, bushes, rubbish and other objectionable material. Particular care shall be taken to exclude all organic matter from the material to be placed in the fill. All materials thus cleared, which can be burnt shall be completely burnt. Balance shall be disposed off as specified. The cleared areas shall be maintained free of vegetation growth during the progress of the work.

2.3 Stripping

Borrow area shall be stripped of top layer by a depth of minimum 150 mm. The exact depth of stripping shall be decided by the Engineer-in-charge depending upon nature of top layer and the vegetation present.

2.4 Borrow area watering & dewatering

The natural moisture content of material in the borrow areas as well as the optimum moisture corresponding to the Proctor's maximum dry density for the material in the particular borrow area shall be obtained from laboratory tests. Additional moisture, if required, shall be introduced into the borrow area by watering well in advance of excavation to ensure uniformity of moisture content. If in any borrow area before or during excavation there is excess moisture, steps shall be taken to reduce the moisture by the selective excavation to secure the materials of required moisture content by excavating drainage ditches, by all owing adequate time for drying or by other means. To avoid formation of pools in the borrow areas during excavation operations, drainage ditches from borrow areas to the nearest outlets shall be excavated so as to obtain homogeneous mix. In general, all materials from a particular borrow area shall be mixture of materials obtained for the full depth of cut.

3.0 FILLING WITH POND ASH

3.1 Placement

After the area has been prepared and levelled, as per cl. 1.0 above, pond ash excavated from Borrow areas having required moisture content shall be placed in layers not exceeding 300 mm in compacts thickness. The combined excavation and placing operations shall be such that the material when compacted in the fill will be blended sufficiently to produce specified degree of compaction and stability.

No stones, cobbles or rock fragments, having maximum dimensions more than 100 mm shall be placed in the fill, Such stones and cobbles shall be removed either at the borrow pit or after being transported to the fill but before the ash in the fill is rolled and compacted.

3.2 Procedure

The material shall be placed in the fill in continuous horizontal layers, stretching right across the whole section, not more than 300 mm in compacted thickness and rolled as herein specified. The length of one layer shall not exceed 150 meters at one stretch. The layers

shall be compacted in strips overlapping not less than 600 mm, if the rolled surface of any fill is found to be too wet for proper compaction, it shall be raked up, allowed to dry, or shall be worked with a harrow or any other approved equipment to reduce the moisture content to the required amount and then it shall be re-compacted before the next layer of ash is placed. Ash surfaces are likely to become dry in short intervals especially during hot and dry weather and hence enough moisture shall be added between difference passes to ensure proper compaction.

3.3 Compaction

The compaction of each layer shall be carried out so as to achieve in –situ dry density not less than 95% of maximum dry density (MDD) of the material found out as per I.S 2720 (Part VII). To achieve the 95% compaction level use of vibratory rollers shall be made. Required nos, of passes shall be made so as to achieve desired compaction. Nos, of passes required shall be verified through trials tests before actual execution of work. The broad specifications of vibratory rollers required for the purpose is as follows:-

a) Static Weight = 6 to 10 t
b) Static Linear Load = 20 – 35 kg/cm
c) Frequency = 18 – 30 Hertz (1100 to 1800 vibrations/ minute)
d) Amplitude of vibrations = 0.5 mm to 1.5 mm

3.4 Weather conditions

Fill materials shall be placed only when the weather conditions are satisfactory to permit accurate control of the moisture content in the materials.

3.5 Moisture control

Prior to and during compacting operations, the materials in each layer of ash/earth shall have a moisture content about 2% less for earth fill (for earth cover) and about 5% less for ash, than the optimum moisture content. This shall however, be adjusted, accordingly to the weather conditions. So far as practicable the materials shall be brought to the proper moisture content in the borrow area before excavation. If additional moisture content is required, it shall be added at the fill site by sprinkling water before rolling the layer. The contractor shall make his arrangements for supply of water in borrow areas as well as in the fill area. If the moisture content is greater than required, the material shall be spread and allowed to dry before starting rolling. The moisture content shall be uniform throughout the layer of material and ploughing, harrowing, or other methods of mixing may be required to obtain uniform distribution. If the moisture content is more or less than the range of the required moisture content, or if it is not uniformly distributed throughout the layer, rolling shall be stopped, and shall be started again only when the above conditions are satisfied.

3.6 Earth cover

Earth cover of 500 mm compacted thicknesses on sides shall be constructed simultaneously with the placement of ash fills to ensure homogeneous construction of fill. For balance details, refer clause 4.0 below. All sloping surfaces shall be protected with Turfing.

4.0 PLACEMENT OF EARTH COVER:-

4.1 Borrow Area

It shall be the responsibility of contractor to arrange suitable earth from approved external borrow areas. The earth cover material shall consist of sandy loam free of admixture of stiff clay, refuse, stumps, roots, rock, bushes, weeds or any other material which would be detrimental to the proper development of vegetation growth. It shall not contain stone 25 mm and over in size. The loamy top soil shall have been demonstrated by the occurrence upon it of healthy crops, grass or other plant growth, that is of good quality and reasonably free draining. Other specifications for Borrow area e.g. site clearance, stripping, Borrow area watering/De-watering etc. shall be as per relevant clauses of Borrow area for ash as outlined above i.e clause nos. 2.2, 2.3 and 2.4 above.

4.2 Placement

Earth over on side slopes shall be laid simultaneously with the laying of compacted ash layers. As in the case of ash layers, compacted thickness of earth layers shall not exceed 300 mm. As far as top cover of earth is concerned, after the area has been covered with compacted ash up to 500 mm below the required finished level of the area, a compacted layer of 500 mm thickness of suitable earth shall be placed over ash surface. This cover shall be placed in layers, each layer not exceeding 250 mm in compacted thickness. The combined excavation and placing operations shall be such that the materials when compacted in the fill will be blended sufficiently to produce specified degree of compaction on stability. No stones, cobbles or rock fragments, having maximum dimensions more than 25 mm shall be placed in the earth cover. Such stones or cobbles shall be removed either at the borrow pit or after being transported to the fill but before the earth is rolled and compacted.

4.3 Other requirements

Other requirements of earth cover laying shall be similar to those of ash laying i.e. as outlined in cl.3.2, 3.3, 3.4 and 3.5 above.

5.0 PREVENTION OF POLLUTION

It shall be responsibility of contractor that no air borne and water borne pollution should occur during all stages of his operations such as in Borrow areas, during transportation of ash/ earth, during placement of fill material etc. Contractor shall undertake all measures such as water sprinkling covering moist ash/ earth with tarpaulins in open trucks, etc., to take care of above.

6.0 QUALITY ASSURANCE

Quality Assurance check list is as per Annexure -2.

Annexure - 2

QUALITY ASSURANCE CHECK LIST

This check list is intended to be an aid to the Contractor and the Engineer in identifying aspects of testing materials and workmanship.

All test results must be submitted by the contractor to the Engineer promptly.

The following minimum checks/tests shall be carried out by the contractor for ash and earth at his cost.

Item No.	Type of Test	Frequency/ Quantum of check	Ref. Document	Acceptance norms
1. ASH/ EARTH BORROW AREA				
(a)	Standard proctor Density	Once in 10,000 M^3 of fly ash/ earth	IS : 2720 (Part – VII)	
(b)	Moisture Content	Once for every 2,000 M^3 of borrow area or part there of	IS : 2720 (Part – II)	
2. ASH/ EARTH WORK				
(a)	In-Situ Dry Density	Once for every 10,000 M^2 in each layer of filling. At least one test shall be done per day irrespective of the progress.	IS : 2720 (Part – II & XXIX)	Minimum 95% of standard proctor max. Dry density.
(b)	Moisture Content	- do -	IS : 2720 (Part - II)	As per Specification.

Appendix-II

NTPC Ltd.
Ash utilization Division

Date: 04-03-09

System Circular

Sub: Reclamation of Low lying areas using ash

Corporate Vigilance department has observed various irregularities in the execution of land development work with pond ash at one of NTPC's station. In order to avoid irregularities in such type of developmental works, following guidelines to be adopted by all NTPC stations:

- In case of reclamation of low lying areas with pond ash the pre & post levels of both cutting & filling areas are to be taken up as specified in CPWD specifications/manuals in association of representatives from FQA/ FES.

- Soil required for soil cover of land fills shall be excavated from the land fill site itself and if it is not possible to do so, only the minimum quantity of soil required for the purpose shall be excavated from soil borrow area. In either case, the topsoil should be kept or stored separately. Voids created due to soil borrow area shall be filled up with ash with proper compaction and covered with topsoil kept separately as above. This would be done as an integral part of land fill project within the time schedule of the project.

- The above provisions should be incorporated in Standard Technical Specifications of low lying area development works.

Sd/-
(A. K. Mathur)
Addl. General Manager
Ash Utilization Division

Annexure-F

NATIONAL THERMAL POWER CORPORATION LTD.
CORE ENGINEERING – CIVIL DESIGNS

Ref.: CC: CE/C: MISC
Date: 26.10.1993

CIRCULAR

As per the Policy Guidelines on Utilization of Ash only fly ash based pozzolona cement shall be used in all construction activities in NTPC w.e.f. Jan'95 excepting those structures which are identified as "Critical" structures by the Engineering Division. Keeping this in view, the following structures have been identified as critical structures in which OPC shall necessarily be used:

1. Turbo-generator foundation excluding the raft.
2. Chimney, excluding the raft.
3. Natural draft cooling towers, excluding the foundation and basin.
4. Spring –supported decks of machine foundations.
5. Water intake wells and well foundations.
6. All structures requiring slipform shuttering.
7. All structures requiring grade of concrete M-25 and above.

The fly ash based PPC should conform to IS : 1489 Part-I Latest Edition.

This circular does not, however, cover the cases of abnormal conditions such as presence of high chemical content in soil, aggressive environment, special construction requirements etc. for which the type of cement to be used shall be decided on a case to case basis.

Sd/-
(P. M. Bopanna)
HOD (Civil)

Annexure-G

NTPC LTD.
Ash Management Group
Circular

Ref. : AM-II/Policy/Ash Fund

Dated : 25.3.2014

Sub: Policy Guidelines for Utilization of Ash Fund created from sale of fly ash.

MoEF Gazette notification amendment dated 03-11-2009 on Ash Utilization specified that thermal power stations are permitted for sale of fly ash and the amount collected from sale of fly ash and fly ash based products by coal and/or lignite based thermal power stations or their subsidiary or sister concern unit, as applicable should be kept in a separate account head and shall be utilized only for development of infrastructure or facilities promotion and facilitation activities for use of fly ash until 100 % fly ash utilisation level is achieved; thereafter as long as 100% fly ash utilization levels are maintained, the thermal power stations would be free to utilize the amount collected for other development programmes.

As per existing NTPC's policy on Ash Utilization, sale of fly ash is being carried out by NVVN Ltd. (a wholly owned subsidiary of NTPC) and in compliance to the MoEF notification, the amount collected are being kept in separate account "Ash Fund." In order to utilize this Ash Fund complying MoEF stipulation for Ash Utilization activities so as to enhance Ash Utilization at NTPC stations, detailed guidelines have been framed and approved by competent authority. The guidelines for utilization of Ash Fund for various activities are as under:

(A) The budget/amount of this Ash Fund shall be allocated for (1) Development of Infrastructure/facilities (2) Promotional Activities (3) Facilitation activities (4) Other Expenditures (5) Administrative and Other expenditures (6) Other development programme of the stations.

The lists of the activities are :

(1) **Development of Infrastructure/facilities :** The activities which will be funded from Ash Fund under this head are :

i) Construction of new roads (including bridges/culverts), approach roads adjoining of fly ash storage silos/ash dykes, paving of areas adjoining weigh bridge, brick plant, railway siding, fly ash silo area etc. to facilitate fly ash utilization.

ii) Buying of rakes/locomotive for transportation of fly ash.

iii) Setting up of classifiers for segregation of fly ash ash into different grades and hydra bin for separation of bottom ash.

iv) Retrofitting of Dry Ash Extraction and Storage System (DAES) for the plants whose design life is over i.e. beyond 25 years.

v) Procurement & Installation of weighbridge for weighment of fly ash.

vi) Setting up of ash bricks or other ash based products manufacturing plants.

vii) Fly ash bagging facility.

viii) Fly ash storage capacity addition by installation of additional silos.

ix) Creation of Eco-Park.

x) Preparation of ash utilization master plan including landscaping and plantation at each site.

(2) **Promotional Activities :** List of activities funded from Ash Fund under this head are:

a) Expenditure towards low lying area development using ash inside as well as outside of NTPC premises within 50 Km. of NTPC plant (including cost of excavation, loading transportation, compaction, cost of soil cover, support structure necessary for ash filling as one activity).

b) Expenditure towards demonstration projects for use of ash (i) excavation loading and transportation of ash by trucks/dumpers in backfilling of open cast mine/stowing of underground mine (ii) construction of rail embankment (iii) road construction (iv) wasteland development (v) development of infrastructure for mine stowing/ filling (vi) use of ash bricks/ other ash based products (vii) Expenditure for loading of pond ash for enhancing ash utilization.

c) Expenditure towards cost of transportation for supply of pond ash to farmers fields.

d) Expenditure on transportation of fly ash/ bottom ash/ pond ash to other agencies to enhance ash utilization.

e) Expenditure on manufacture of ash bricks/other ash based products.

f) Research studies, consultation charges, testing charges etc. for ash utilization activities.

g) Promotional activities such as workshop/seminars/training/awareness programmes, advertisement, making documentary film, printing of brochure, booklets etc. for ash utilization activities.

(3) **Facilitation activities:** The activities which will be funded from Ash Fund under this head are :

i. Repair/upgrading/strengthening/widening of existing road, approach roads, adjoining of fly ash silos, ash dyke or other roads to facilitate ash utilization.

ii. Construction of pavement of parking areas for fly ash trucks/tankers/bulkers parking, rest rooms and civil amenities for truck/tankers/bulkers drivers, helpers.

iii. Expenditure in construction of Eco-park for enhancing ash utilization.

iv. Repair and maintenance of infrastructures/ facility developed for ash utilization.

(4) **Other Expenditure:** Any other expenditure in connection with improvement of ash utilization leading to environment improvement, afforestation, economical power etc.

(5) **Administrative and other expenditures:** Expenditure towards administrative and other expenditures, marketing of ash and ash based products, manpower of NTPC – Ash Utilization Cell at Stations, Regional Offices and at Corporate Centre, UPL manpower engaged for fly ash sale/ utilization activities at stations and NVVN office at CC, manpower of NVVN – Ash Business and other related groups, taxes and duties, printing, EDP, office equipment, furniture and fixtures, rent etc.

(6) **Other Development programme:** As long as 100% ash utilization levels are maintained, the thermal power station would be free to utilize amount collected for other development programmes.

(B) Expenditures which will not be considered from Ash Fund are :

(a) Expenditure on infrastructure activities i.e. (i) installation of Dry Ash Extraction system at NTPC's new projects (ii) raising of ash dykes etc.

(b) Capital intensive schemes for back filling of mines shall not be taken up from Ash fund. However, in special circumstances such schemes may be considered from ash fund on specific approval of competent authority i.e. CMD, NTPC.

(c) Any capital expenditure which may be allowed under the extant tariff regulations by CERC will not be met out from Ash Fund. To ensure this capital items identified in the budget proposals by the each station shall be got verified from Corporate Commercial.

(d) Care may be taken that "Ash Fund" is utilized for "Promotional activities" at paragraph 2(a) & (d) only for disposal of ash beyond the contracted quantities offered for sale to different agencies at operating stations.

(C) Procedures for Approval for Activities from Ash Fund :

- In principle approval for activity to be financed from Ash Fund is to be taken up as and when activities (as listed at para A above) are identified by stations. Each station has to make comprehensive proposal, individual activity wise alongwith the objective, year wise plan for expenditure and how it will help in enhancing ash utilization at the station.
- The cost estimate of the proposal for each activity being proposed, should have detail break up checked by Civil/TS and duly vetted by Finance department and approved by Head of the project/RED as per applicable clause of NTPC DOP 2011 depending on the nature of work.
- This proposal then shall be routed through Head of Ash Management Group at NTPC-CC to NVVN Ltd. for allocation of Ash fund.

(D) Budget activity for Ash fund:

- Activity wise budget requirements shall be prepared by each station in the month of April in each year in the format enclosed (Format-I) and shall be sent to AM-CC for compilation and submission to NVVN Ltd. Budget proposal will include all those activities which have earlier been accorded in-principle approval by AM-CC and NVVN. However, if any activities not included in the budget proposal, but needs to be taken up during the financial year, will also be considered form ash fund after having in principle approval of AM-C and NVVN and included for allocation of fund from Ash Fund. AM-CC shall compile station wise budget requirement and shall inform to NVVN for Ash Fund utilization in the month of June.
- Each station has to make maximum efforts for utilization of budget/fund allocated for the activity in the year. Stations shall submit progress of the activities financed from Ash Fund on quarterly basis to AM-CC. Activity which has been agreed from Ash Fund, if not being executed due to any reasons within 2 years of date of sanction by NVVN, shall be informed by station to AM-CC, so that sanctioned Ash Fund can be allocated for other activities.

(E) Accounting & Disclosure of Ash Fund

NTPC Stations shall incur the expenditure and then transfer to NVVN for adjustment of fund under the intimation to Ash Management Group-CC. All the expenditure should be supported with all relevant documents/bills/approvals and copy of the same shall be forwarded to NVVN for audit purpose. The accounting, maintenance and disclosure of the Ash Fund shall be done by NVVN.

Stations must have to ensure that entire expenditure booked under the Head "Ash Utilization and Marketing Expenses" is transferred at the quarter end along with supporting documents to NVVN for reimbursement out of Ash Fund.

If the sale of fly ash and ash based products is done by NTPC station directly with specific approval, sale proceeds of fly ash shall be transferred to NVVN on quarterly basis in GL code 2012023 – "Fly Ash Utilization Fund" account for accounting disclosure and allocation purposes.

(F) This policy will be reviewed every year.

These policy guidelines are for implementation by all NTPC stations.

Sd/-
(Ajit Kumar)
AGM (I/c)- Ash Management Group

Format- I

Budget from Ash Fund for Ash Utilization activities

Plan for Ash Utilization activities for the year ..... (say 2014-15)

Station:

..... (Name of Station)

Sl. No.	Name of Activity with Brief Details	Ref. of approved note of In-principal approval	Total budget approved by AM-CC	Fund required ₹ in Lac (2014-15)	Estimated Ash Utilization (lac tone) (2014-15)	Fund allocated in previous year i.e. 2013-14 (₹ Lac)	Fund utilized in previous year i.e. 2013-14 (₹ Lac)	Remark
1.								
2.								
3.								

Annexure-H

DELEGATION OF POWERS FOR ASH UTILIZATION ACTIVITIES AT STATIONS/ REGIONS

Sl. No.	Nature of Power	RED	Head of Station/ Project	Head of AUD	Remarks
1	Terms and Conditions				1(a) & 1(b) with concurrence of Fin. and in accordance with approved policy and guidelines.
	(a) Disposal/ Sale of ash/ fine fly ash/ processed fly ash generated by NTPCs Stations.	Full Powers	Full Powers	-	
	(b) Sale of ash based products manufactured by NTPC plants.	Full Powers	Full Powers	-	
2	Disposal/ Sale of ash generated on terms and conditions approved vide 1(a) above by calling of tenders * and award against.				Disposal/ sale in accordance with approved policy and guidelines and with concurrence of finance.
	a) Open tender	Full Powers	Full Powers		
	b) Limited tender	Full Powers	Full Powers		
	c) Single tender	Full Powers	Full Powers		
3	Sale of ash products on terms and conditions approved vide 1(b) above by calling of tenders and award against:				Sale in accordance with approved policy and guidelines and with concurrence of finance.
	a) Open tender	Full Powers	Full Powers		
	b) Single response against open tender	Upto ₹ 800 lakh in each case	Upto ₹ 200 lakh in each case		
	c) Limited tender	Upto ₹ 350 lakh in each case	Upto ₹ 100 lakh in each case		
	c) Single tender	Upto ₹. 100 lakh in each case	Upto ₹ 50 lakh in each case		
4	Award for sale of untied/ not-lifted / balance quantity of fly ash and fly ash based products to interested parties on same Terms & Conditions on discovered price.	Full Powers	Full Powers	-	In accordance with approved policy and guidelines.
5	Sanction of advertisement for invitation of tenders, seminar, and other publicity matter on the subject through empanelled agencies.	Full Powers	Full Powers	-	As per the rates in National dailies and other Publication in consultation with PR Deptt. subject to budget provision and approved policy guidelines.

Sl. No.	Nature of Power	RED	Head of Station/ Project	Head of AUD	Remarks
6	Market survey and investigations	Full Powers	Up to ₹ 10 lakh in each case	-	Subject to budget provisions
7	Sanction to incur cost for publicity and business promotion in consultation with Finance.	Full Powers	Up to ₹ 10 Lakhs per Occasion	-	As per prevalent rates for National/ Regnl. Dailies in consultation with PR subject to budget provisions and as per approved policy and guidelines.
8	Power to execute legal documents in respect of all activities during execution of any contract including marketing.	Full Powers	Full Powers	-	Subject to vetting by CLO, Agreement requiring common seal will require Board's approval.
9	Sanction for appointment of Executives/ supervisors casual/daily rate employees though UPL.	Full Powers	Full Powers	-	Subject to approved policy and guidelines.
10	Purchase of sundry requirements for manufacture of ash based products.	Up to ₹ 50 Lakh	Up to ₹ 25 lakhs	Upto ₹ 10 lakh	Subject to approved guidelines and system mentioned sl. No. 10 in Section -II of DOP 2012.
11	Award of work for repairs of equipment, machineries of plant and laboratory.	Full Powers	Full Powers	Upto ₹ 1 lac. in each case	Subject to budget provisions.
12	Sanction of petty contingent expenditure of recurring & non-recurring nature.	Full Powers	Full Powers	Upto ₹ 20,000 in each case	Subject to total ceilings in budget.
13	Technical approval & award for testing of ash & ash based products and other related items like clay, soil, lime, gypsum, cement etc.	Full Powers	Full Powers	Up to ₹ 1 lac in each case.	Such investigation may be done by institute / laboratory, test houses like National Council for Cement and Building Materials, CSIR Institute/ laboratories, Shri Ram test House, IIT or any other recognized laboratory subject to reasonableness of charges.

* Through e-tender and book building process

Note:

a) For any item not covered above, regular NTPC, DOP shall be referred.

b) All expenditure decision above ₹ 50,000/- shall be with concurrence of associated Finance Deptt. (Except for the case at Sl 10 above. Sl.10 shall be as per remarks of Sl. No. 10 in Section –II of DOP 2011.)

c) Technical and administrative approval of proposals: For cases, where approval for technical and administrative of the cost estimate shall be required, Head of the Project/Station shall have “Full Power” after vetted in Finance.

d) Above Delegation of Power for Ash Utilization activities at site may supersede the earlier DOP vide Office Order No. 174/98 dated 12-10-98 of DOP 2005 for Ash Utilization activities at site after the approved by Competent Authority.

Annexure-I

Activities & Responsibilities

(Policy for Ash & Ash Based Products Business)

A Setting up Fly ash Brick plant:

Sl. No.	Activity	Responsibility	Remarks
1	Demand survey for fly ash bricks	HoP	1. Selection of dealer for marketing of fly ash bricks and out sourcing for running of brick plant shall be done through transparent system. 2. Selection of JV partner for fly ash brick plant shall be done in association with Region, AM-CC and approved by CMD. 3. Formation of JV Company shall be approved by CMD.
2	Tendering, procurement & installation of fly ash brick plant	HoP	
3	Fixation of price of fly ash bricks	HoP as per recommendation by a committee	
4	Finalization of modalities and appointment of reputed dealers for sale of fly ash bricks.	HoP as per recommendation by a committee	
5	Outsourcing for running of fly ash brick plant and marketing of fly ash bricks.	HoP as per the guidelines issued by AM-CC	
6	Explore possibility of forming JVs/ leasing of brick plants to interested brick manufacturer/ agency for optimum capacity utilization.	HoP as per the guidelines issued by AM-CC	
7	Explore possibility for setting up large capacity of fly ash brick plant under JV.	HoP as per the recommendation by committee.	
8	Finalization of terms and conditions for selection of JV partner and inviting EoI for setting up fly ash brick plant under JV.	HoP in association with Region, AM-CC and approved by CMD	
9	Selection of JV partner and MoU	HoP in association with Region, AM-CC and approved by CMD	

B Setting up of Cement plant

Sl. No.	Activity	Responsibility	Remarks
1	Techno-economic feasibility study for setting up of cement plant.	HoP	1. Selection of Dealer for marketing of cement and out sourcing for running of cement plant shall be done through transparent system. 2. Selection of JV partner for cement plant shall be done through transparent system in association with Region, AM-CC and approved by CMD. 3. Formation of JV Company shall be approved by CMD.
2	Finalization of terms and conditions and inviting EoI for selection of JV partner	HoP in association with Region, AM-CC and approved by CMD.	
3	Selection of JV partner and MoU	HoP in association with Region, AM-CC and approved by CMD	
4	MoU/ long term agreement with cement companies for assured off- take of fly ash in association with Region and AM-CC.	HoP as per the guidelines/ format issued by AM-CC.	
6	Outsourcing for running of cement plant and marketing of cement, if set up by own.	HoP in association with Region, AM-CC and approved by CMD	

C Setting up of Light Weight Aggregate Plant (LWA)

Sl. No.	Activity	Responsibility	Remarks
1	Techno-economic feasibility study for setting up of light weight aggregate plant	RED	1. Selection of Dealer for marketing of LWA and out sourcing for running of LWA plant shall be done through transparent system. 2. Selection of JV partner for LWA plant shall be done in association with Region, AM-CC and approved by CMD. 3. Formation of JV Company shall be approved by CMD.
2	Selection of Station for LWA plant	RED	
3	Tendering, procurement & installation of LWA plant	HoP	
4	Fixation of price of LWA	HoP as per recommendation by a committee.	
5	Finalization of modalities and appointment of dealers for sale of LWA.	HoP as per recommendation by a committee.	
6	Outsourcing for running of LWA plant and marketing of LWA.	HoP as per the guidelines issued by AM-CC.	
7	Finalization of terms and conditions for selection of JV partner and inviting EoI for setting up LWA plant under JV.	HoP in association with Region, AM-CC and approved by CMD.	
8	Selection of JV partner and MoU	HoP in association with Region, AM-CC and approved by CMD	

NTPC - Dadri