

Management and Utilization of Fly Ash Over Last Few Years In India: A Review

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Abstract - Fly ash is a fine particle that is principally a secondary product of coal combustion and other waste materials that are driven out of the boiler with the flue gases. The fine particles that are deposited at the bottom are called bottom ash. Fly ash is nothing but a by-product of burning pulverized coal in an electrical generating station (Thermal Power Plants, TPP's). Specifically, it is the unburned residue that is carried away from the burning zone in the boiler by the flue gases and then collected by either mechanical or electrostatic separators. Disposal of Fly Ash is one of the concerns for Thermal Power Plants. Proper disposal of fly ash is not so easy and if in case, fly ash collection systems are not very efficient enough, a portion of it escapes into the atmosphere causing environmental pollution. To overcome this seriousness, Government of India notified FlyAsh Notification on 14th September, 1999 and its subsequent amendments. The main objective of FlyAsh Notification is to protect the environment, conserve top soil and prevent the dumping and disposal of fly ash discharged from coal or lignite based thermal power plants on land. Another major reason for the Notification is to restrict the excavation of top soil for manufacture of bricks and promoting the utilization of fly ash in the manufacture of building materials and in construction activity within a specified radius from coal or lignite based thermal power plant. Utilization of fly ash can result not only in reducing the magnitude of the environmental problems, but it is also to exploit fly ash as raw material for value added products (and conserve traditional materials), and for extraction of valuable materials.

History

For proper management and utilization of Fly Ash, Ministry of Environment, Forest and Climate Change, Government of India has issued first Notification on 14th September, 1999 which has subsequently been amended in 2003, 2009 and 2016. The objectives of this notification are to protect environment, conserve the top soil, and prevent dumping of fly ash from Thermal Power Stations on land and to promote utilization of ash in the manufacture of building materials and construction activity.

Fly Ash Notifications over the years

Fly ash notification 1999 mandates the use of fly ash for the purpose of manufacturing ash-based products such as cement, concrete blocks, bricks, panels or any other material or for construction of roads, embankments, dams, dykes or for any other construction activity within a radius of **50 kms** from thermal power station.

- Fly Ash notification has been amended on 27.08.2003 with the objective to enhance the fly ash utilization by increasing jurisdiction of the area of application of the notification from **50 km to 100 km**. This amended Notification mandates building construction projects to use ash based bricks /blocks /tiles in phase manner i.e. 25% by 31stAugust 2004; 50% by 31stAugust 2005;75% by 31stAugust 2006; 100% by 31stAugust 2007. Amendment also provides to utilize fly ash in Road / Flyover construction as per IRC SP:58 specifications; voids of borrowed area to be filled up with Ash; reclamation of low lying areas to be done only with Pond Ash etc.
- Fly ash notification has been further amended on 3.11.2009 and the scope of the notification has been broadened by introducing mandatory usage of fly ash in the external overburden, mines backfilling or stowing of mines. Notification also prescribes the targets of Fly Ash utilization in a phased manner for all Coal/Lignite based Thermal Power Stations in the country so as to achieve 100% utilization of fly ash.It is mandatory to all construction agencies/Govt. Department undertaking road projects, fly over/ bridges as well as local authorities to make provisions of use of fly ash in their tender documents and schedule of material and rates. It also prescribes to constitute a Monitoring Committee at the Central level and State level to monitor the implementation of provisions of fly ash notification.
- The implementation of this Notification has resulted in steady increase in the utilization of fly ash. However, the utilization has not reached to 100% and certain additional measures are required to be taken to promote and facilitate its use. In the recently amended notification dated 25.01.2016, the scope of the notification is broadened to enhance the utilization of the fly ash for various gainful activities and to promote and facilitate utilisation of ash based products in construction activities and using ash as soil conditioner. The Salient features of the fly ash notification 2016 are as given below:
 - i. The mandatory jurisdiction of the area of application of the notification is increased from **100 km to 300 km**.

- ii. The cost of transportation of ash up to 100 km distance shall be borne by the Thermal Power Plants (TPPs). The transportation cost between 100 km to 300 km shall be shared equally between the user and TPPs.
- iii. The amendment mandates use of fly ash based products in road construction projects under Pradhan Mantri Gramin Sadak Yojna and asset creation programmes of the Government involving construction of buildings, road, dams and embankments and the entire cost of transportation of ash to these project sites shall be borne by the TPPs.
- iv. The Ministry of Agriculture shall promote Fly Ash utilization in Agriculture as soil conditioner.
- v. TPPs to upload the details of stock of ash available on their website.
- vi. TPPs to provide dedicated dry ash silos and separate access roads. This shall ease the delivery of fly ash.

Status of Fly Ash utilization in India

As per CEA report, Fly Ash generation and utilization in 2016-17 from 155 coal/lignite based thermal power stations of various power utilities in the country is 169.25 and 107.10 million-ton respectively. The utilization of fly ash has increased from 6.64 million ton in 1996-97 to a level of 107.10 million-ton in 2016-17. The percentage of fly ash utilization during 2016-17 has been 63.28%. During 2016-17, out of total fly ash generation, 23.98% of total fly ash was used in the Cement sector, followed by 8.81% in making bricks & tiles, 7.02 % in ash dyke raising, 6.96% in mine filling, 6.52 % in reclamation of low lying area, 3.66 % in roads & embankments, 1.14 % in agriculture, 0.45 % in concrete, 0.01 % in Hydro Power Sector, 4.72 % in Others and 36.73% remained as unutilized fly ash

Conclusion

The present review has summarized key studies related to utilization of Fly Ash in India and focuses on Notifications brought by Government of India to utilize 100% Fly ash. Fly Ash finds a numerous applications in the cement industries, agricultural field, polymer industry, construction industry etc. With number of constructive applications, Fly Ash can be utilized in a fruitful manner so that its full utilization can be achieved.

References:

- [1] Ministry of Environment and Forests, Government of India –Utilisation of Fly Ash by Thermal power plants Notification, S.O.763(E) Dated 14th September, 1999.
- [2] Ministry of Environment and Forests, Government of India –Utilisation of Fly Ash by Thermal power plants Notification, S.O.979(E) Dated 27th August, 2003.
- [3] Ministry of Environment and Forests, Government of India –Utilisation of Fly Ash by Thermal power plants Notification, S.O.2804 (E) Dated 3rd April, 2009.
- [4] Ministry of Environment and Forests, Government of India –Utilisation of Fly Ash by Thermal power plants Notification, S.O. 254(E) Dated 25th January, 2016.