ISSN 2348 – 8034
Impact Factor- 3.155

GLOBAL JOURNAL OF ENGINEERING SCIENCE AND RESEARCHES

WASTE MANAGEMENT & USE OF FLYASH IN CONSTRUCTION

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ABSTRACT

Flyash is a by-product of thermal industries produced in abundance due to burning of coal. According to I.R.C., S.P.-58-2001, nearly 170 million tones of flyash is being produced annually in India and only approximate 3% of flyash so produced has received gainful application. This figure is around 80% in foreign countries.
Thus it is quite evident that there is great potential for flyash to be used in India for various gainful purposes. For all constructions, we need brick chimneys of traditional clay brick plants which emit huge amount of Co2. This carban emission is a great danger to environment. The cost of clay brick has also gone up.
The Govt. of India, Ministry of Environment and forest have also realised the need of utilisation of flyash and has made it mandatory to ensure the use of ash in the manufacture of bricks, blocks, tiles etc. within 100 km radius of thermal power plants.
The Bureau of Indian standard has also felt the need of generation of better quality of flyashes and its wider application. They have also revised IS-3812-1981 in this regard.

Keywords—*Flyash, Utilization, Environment,*

I. INTRODUCTION

It would be very much in the interest of boosting economy to the state of Bihar to finalize projects for use of flyash on a commercial scale.
In the first sight the problems coming in the way of commercialization of flyash industries are shortage of electric power in the state, poor transport conditions, lack of awareness to the common mass, lack of motivation etc. These problems are necessary to be discussed and solutions must be identified therefore.

II. BACKGROUND

Studies show that one tonne of Portland cement production discharges 0.87 tonne of CO_2 into the atmosphere. Every year barren land area approximately 1.5 times of Indian territory need to be afforested to compensate for the total global accumulation of carbon dioxide discharged into the atmosphere because of total global cement production. Utilisation of flyash in cement/concrete minimises the Co_2 emission problem to the extent of its proportion in cement. Use of Flyash - Sand-lime-gypsum bricks also brings similar environmental benefits if used in place of burnt clay bricks.

III. MAIN THRUST

Sustainable ash utilisation is one of the key concerns at NTPC. The Ash Utilisation Division (AUD), set up in 1991, strives to derive maximum usage from the vast quantities of ash produced at its coal based power stations. The AUD proactively formulates policies, plans and programmes for ash utilisation. It further monitors the progress in these activities and works for developing new segments of ash utilisation. Ash Utilisation Cell at each station, handles ash utilisation activities.

The quality of flyash produced at NTPC's power stations is extremely good with respect to fineness, low unburnt carbon and has high pozzolanic activity and conforms to the requirements of IS 3812 – 2003-Pulverized Fuel Ash for use as Pozzolana in Cement, Cement Mortar and Concrete. The flyash generated at NTPC stations is ideal for use in manufacture of Cement, Concrete, Concrete products, Cellular concrete products, Bricks/blocks/tiles etc. To facilitate availability of dry flyash to end – users, dry flyash evacuation and storage system have been set up at coal based stations. Further, at NTPC-Rihand facility for loading flyash into rail wagons has been provided so that flyash can be transported in bulk quantity through railway network. Such facility is also being provided at all new up coming coal based power stations.

Over the years, the Ash Utilisation level has reached from meagre 0.3 million tonne in 1991-1992 to 26.03 million tonne in 2010-11.

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The various segments of ash utilisation currently include cement, asbestos – cement products & concrete manufacturing industries, land development, road embankment construction, Ash Dyke Raising, building products such as bricks/blocks/tiles, reclamation of coal mine and as a soil amender and source of micro and macro-nutrients in agriculture.
Ministry of Environment & Forests (MoEF), Govt. of India vide its notification (Amendment) dated 3rd Nov. 2009 has made it mandatory to utilize flyash bricks and its application.

IV. FUTURE TREND

Compared with the deposition of ash nearby the power plants, the utilization of the same is generally less favorable from the point of view of management because more or less heavily capitalized facilities for treatment, storage and transport need to be installed. Utilization of ash also requires greater manpower. From the point of view of nation's economy, however, utilization of such a by-product also involves various advantages, which justify a certain pressure to proceed to utilization despite high cost. The additional expenditure, however, should be accompanied by supporting governmental regulations either by way of the same being mandatory or in-built incentive in the system for utilization of ash as a by-product from the thermal plant. The utilization should range from low value-added applications like its uses in road/embankment, land fill, cement fly ash concrete, lime fly ash concrete etc. to high value-added utilization which for the present are mostly on the laboratory scale and may need about 3-5 years for its commercialization. Extraction of cenospheres, alumina, magnetite, manufacture of acid resistant bricks/tiles, fire resistant bricks/tiles, light aggregate etc. are some of the areas which in near future may be high value-added products.
Another important field of ash utilization is its contribution in reduction to global warming by suing fly ash for making bricks & cement. The bricks and cement industry generates about 10% of India's total Carbon Dioxide (CO_2) emission.
The choice of right method of utilization for a power plant by-product depends on multiple factors.
It is prudent to use different method of ash utilization at the same time in order to be as independent as possible from market fluctuations. In the initial stages it may be more appropriate to adopt a technology of mass applications low priced material and gradually produced high value-added products.

V. CONCLUSION

It is essential to go into various possible usage and disposal arrangement to which the ash can be put prior to its adoption for particular power plant. No single utilization method holds the potential to provide a solution to the challenging task of utilization and disposal of flyash. A judicious mix of number of applications is required to be implemented simultaneously to increase percentage utilization and eco-friendly disposal of flyash. Of the various areas of ash utilization, depending upon case to case, the appropriate approaches have to be adopted for total Flyash Management.

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ISSN 2348 – 8034
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