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TECHNICAL ASPECTS OF CAPTURE INSTALATION OF FLY ASH FROM THERMAL POWER STATIONS

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Abstract: *Fly ash is comprised of the non-combustible mineral portion of coal. When coal is consumed in a power plant, it is first ground to the fineness of powder. Blown into the power plant's boiler, the carbon is consumed — leaving molten particles rich in silica, alumina and calcium. These particles solidify as microscopic, glassy spheres that are collected from the power plant's exhaust before they can "fly" away — hence the product's name: Fly Ash. Fly ash is generally captured from the chimneys of coal-fired power plants, whereas bottom ash is removed from the bottom of the furnace. In the past, fly ash was generally released into the atmosphere, but pollution control equipment mandated in recent decades now require that it be captured prior to release.*

Key words: *Fly ash, equipment, collected, thermal power station*

1. INTRODUCTION

The installation that will be presented is achieved and assembled at CET Brasov. The installation is designed to operate in automatic mode, without damage the-production process and respecting all environmental requirements.

The fly ash collection is made by boilers 1 and 2 area, to the function either of the boiler 1, either of the boiler 2, or simultaneous operation of two boilers.

The fly ash transport by storage silo is made with machines equipped with special containers, with load capacity of 25t.

The load of fly ash from storage silo is made by the driver vehicle, which is instructed in this sense. The installation is designed it can be used non-stop.

2. THE CONSTRUCTION OF THE INSTALLATION FROM CAPTURE THE FLY ASH

The layout is presented in Figure 1. At choice and placement of of all components to be considered:

In the case of the appearance of accidental defects, the installation from capture the fly ash to be equipped with safety elements (flap valve). This elements permit the troubleshooting without affecting the production process of the plant.

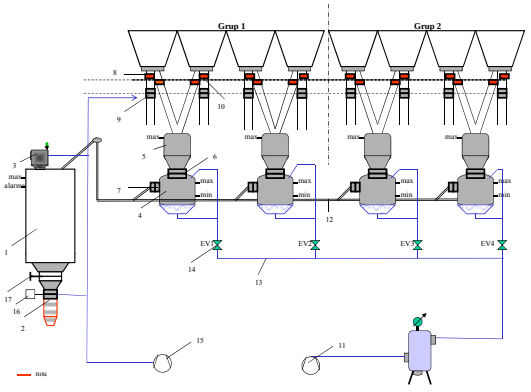

Fig.1. The layout of installation from fly ash recovered

1 - storage silo, 2 - joystick Beumer type BF401 for uploaded fly ash, 3 - filter type OSF-K, 4 - steel container for ashes collected from to the electro RI, 5 - RII steel container intermediate, 6 - Inflatek valve dn = 200mm to enter the container, 7 - dn = 100mm Inflatek valve out of the container, 8 - lance Sibar (safety), manual l = 400mm, 9 - pneumatically operated lance sibar l = 200mm, 10 - lance sibar (belts), manually operated l = 200mm, 11 - electrocompressor for transfer the fly ash of container in storage silo, 12 - pipes for ash collection and storage in containers, 13 - transfer tubing from the container of ashes in RI storage silo, 14 - valves, 15 – electrocompressor to actuation pneumatic control, 16 - valve, 17 - manually sibar.

- The dimensioning of tanks RII and RI 4 and 5 position in figure 1, were made so that to ensure a efficiency of capture by minimum 0.85. the metallic construction of RI and RII containers is attached with screws from concrete M16 on the platform.
- The dimensioning of compressors, valves and piping were performed so that, they can collect a minimum amount of ash 25-30t/hour.

The silo storage of fly ash figure 2 has a capacity for 150 t, and is located near the electrostatic precipitators.

The technical characteristics of storage silo are: vertical cylinder is made of sheet 5 mm, with a diameter of 6000mm and height of 7800mm, cylinder is composed of sections fixed with bolts. The cone trunk are 4300mm height, and is located at the bottom of the cylinder. structure is supported on four metal legs with caisson section.

Fig. 2. Storage silo

The total height of silo is about 18,00 m and the weight of the silo empty is 13t. the full weight of silo with fly ash γ=0,72 is 150t.

According to HG no. 1231/2008 is fall into the category of importance C, namely the normal importance. According the Normative P100 92 the construction is located in seismic zone D where the seismic coefficient is Ks = 0,16, the corner period Tc = 1 sec., the reduction coefficient of seismic effects is Ψ = 0,65, coefficient of dynamic amplification β = 2,5, coefficient of equivalent modal ε = 1 results that the global seismic coefficient is c = 0,312 respectively the seismic load is S = 49t. Under these conditions to anchor the bolts are necessary 8M48/ leg on S355.

The above considerations has adopted the anchor variant of silo of armed concrete structure, anchor necessary for the transmission of horizontal load (seism, wind) at armed concrete structure. The foundation take the gravitational load from silo.

3. CONCLUSIONS

Fly ash is generally captured from the chimneys of coal-fired power plants, whereas bottom ash is removed from the bottom of the furnace. In the past, fly ash was generally released into the atmosphere, but pollution control equipment mandated in recent decades now require that it be captured prior to release.

Ash handling refers to the method of collection, conveying, interim storage and load out of various types of ash residue left over from solid fuel combustion processes.

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