OEM- Design Cost Control v/s Customer-End User Operation Cost (AFBC Boiler)

Tube failures in AFBC boilers in Furnace Bed Coil & Bed Super heater

Most of the tube failures reported in AFBC boilers is in Furnace Bed Area i.e. Bed Coil & Bed Super heater. There are some most important factors, which are playing a vital role in bed tube failures.

During project ordering & execution stage, most of the customers are not mentioning the specific checks & controls regarding the AFBC boiler fail safe & beneficial design. They are not exploring & recording the range of some essential velocities, temperatures & pressure drops etc, which are dominating the pressure parts and auxiliaries sizing during the design calculation of AFBC boiler.

Today, we are providing some basic concept regarding the correlation between the bed tube failures & OEM design cost control, which overall impacting on boiler operation and finally trouble started to customer - end users.

Major Design Cost Control Parameters for Furnace Bed

1. **Fluidisation Velocity**
2. **Bed Temperature**
3. **Furnace Temperature**
4. **Free Board Combustion**

The above parameters are correlated with each others and variation during operation from design consideration will disturb the bed characteristics.

OEM will always design with cost optimisation in absence on customer specific checks & controls regarding the AFBC boiler, hence bed area will reduce during design.

While during AFBC boiler operation, parameters changes happens due to unavoidable circumstances and fuel properties resulting

1. High Fluidisation velocity w.r.t. design value lead to erosion of tubes and finally tube failures happen.

2. High bed Temperature w.r.t. design value lead to effect fluid circulation inside the tubes, high metal temperature and lead to erosion of tubes and finally tube failures happen.
3. High Furnace Temperature w.r.t. design value lead to effect secondary combustion in superheater zone, high back end temperature, fluid circulation inside the tubes, high metal temperature and finally tube failures happen.
4. Low Furnace Temperature w.r.t. design value lead to increase in bed temperature and minimize free board combustion. It's effect will deliver on fluid circulation inside the tubes, high metal temperature and finally tube failures happen.

M/s Unite Energy Corporation LLP suggest to control the above parameters within the prescribed limits and shall be taken care during ordering, procurements and engineering stage itself.

We will come soon with another concept to fulfil our mission "ENERGY CONSERVATION & TROUBLE FREE WORK ENVIRONMENT" with an idea to reduce plant's cost & maintenance.

Unite Energy Corporation LLP is keen to provide our best after sales & spare services support to you to mitigate the irregularities in the plant, best technical services to mitigate breakdown, minimize downtime, improvise design and system performance through inspection, operational recommendations, genuine analysis, training and skill enhancement etc, to improve the overall plant's health and performance. We are eager to fulfil our commitment towards energy conservation, a smooth & trouble free work environment at all times.

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