DESIGN & PERFORMANCE OF SLOP FIRED BOILER & HIDDEN COST TO CUSTOMER

Performance & Troubles of Slop - Spent wash Incineration Boiler

It is heard that Slop Fired Boiler are guaranteed to operate more than 99 days continuously without any Interruptions or Stoppage, Is it true?

NO, it's Doubtful, till now it is not achieved. This figure of days is just an Eye Wash, A few hours stoppage & under rated design flow of slop give the breath to boiler to sustain.

OEM & Management Proudly Celebrate that "TARGET ACHIEVED" but it is only a bluff & all burden with defects are transferred to Customer's operational team & plant's personnel.

As per my perspective, Fuel Efficiency & Cost effective operation of boiler has never achieved till date with slop firing, but which is claimed in contract & design guarantees, however struggle continues.

Just think about the Losses in Slop fired Boiler operation:-

1. Excess Bagasse / Coal demand @ 100% MCR
2. Boiler Efficiency consistency - just try to get
3. Slop Brix quality variation within design - just try to get
4. Boiler loading @ 110% MCR - just try to get
5. High Auxiliaries's / Internal Steam consumption
6. Unstable Combustion
7. Furnace Back Puffing
8. Unstable Oxygen in operation
9. High Emissions from stack - White Smoke is Emission
10. Abnormal Furnace Exit Gas Temperature
11. High APH Exit Gas Temperature
12. High Auxiliaries's power consumption
13. ON-OFF mode of Steam Coil Air Preheater (SCAPH)
14. Slop/Spent Wash Carry Over with Flue gas
15. High Unburnt in Ash & High Heat loss
16. Soot blowing in every TWO hours
17. Pressure Parts Vibration

18. High Maintenance & Spare cost
19. Safety of Plant's Personnel & Equipments
20. Noise & Nuisance

Some Other Hit & Trials, Manipulation are still continue on cost of plant's reliability & safety, They are:-

1. Slop Brix, Slop Density, Slop Temperature, Slop Sedimentation, Impurities in Slop, Sludge etc are favourable tool to adjust the boiler performance used by OEM
2. Application & Removal of Refractory Layer on water wall to adjust the Furnace Exit Gas Temperature
3. Throwing of crackers to dislodge ash deposition in ash collecting hoppers
4. Use of SCAPH in ON & OFF mode operation to adjust APH exit gas temperature to adjust the boiler performance. SCAPH installed is used for boiler performance adjustment
5. High flue gas temperature at superheater inlet accelerating the fouling and corrosion of SH due to chlorides in ash, alkalies in ash
6. Adjustment of Feed water Temperature at Inlet of Economiser / Deaerator Outlet for boiler operational profile manipulation and performance adjustment
7. Less Slop firing temperature in slop feeding circuit than design requirement at rated slop flow
8. Slop dripping & piling on Stoker Surface & in Air entry hopper
9. Ash bridging in Pressure parts hence high draft & gas velocity disturbance
10. Soot Blower, Wall Blowers, Slop gun cleaning, Slop temperature rise in tank etc using steam steam means high steam injection in boiler i.e. high fuel consumption
11. Opening of Ash Hopper's Manhole just after stopping the boiler, without knowing the ash level & air ingress quantity to initiate unburnt combustion
12. Fans are under rating i.e. not taking care of continuous furnace back puffing
13. Water cleaning & Mechanical cleaning to keep the boiler operation alive
14. Disturbed sealing & operation of ash handling system due to back puffing

Challenges with Slop - Spent wash firing in boiler

1. High Deposition, Ash Bridging & Fouling
2. Less Availability
3. High Potential for Slagging
4. Clinker formation
5. Frequent Cleaning
6. High Back puffing

Vigilant / Control in Slop - Spent wash in boiler

1. Keep Furnace flue gas temperature below 720 ^{O}C at exit of first pass
2. Keep flue gas temperature below 580 ^{O}C at Superheater Inlet
3. Ensure Correct location & installation of all measuring Instruments
4. Keep all Ash hoppers outlet size big enough to handle clinker ash flow
5. Keep Feed water Temperature at Inlet of Economiser / Deaerator Outlet as per design, preferable is 140 to 150 ^{O}C.
6. Do not give extreme focus on Slop Brix, Maintain it in-between the design contractual value to obtain best efficiency.
7. High Soot blower frequency is a indication of fuel carryover & poor performance of soot blowers. In long run it will impact on boiler reliability.
8. SCAPH provided for improvements not for operation adjustments
9. Avoid air ingress in boiler to improve reliability & reduce failures
10. Do not try to avoid steam drum level fluctuation by applying DUMPING in level transmitters, This DUMPING will not reduce Water Carry Over from Steam drum to Super heater & Turbine.

Unite Energy Corporation LLP is assuring customers that this article shall help them to get best results from Slop fired boiler. Our mission of **"ENERGY CONSERVATION & TROUBLE FREE WORK ENVIRONMENT"** with an idea to reduce plant's cost & maintenance.

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